JUNE | 1958

products finishing

How to Produce Zinc Chromate Coatings Page 32

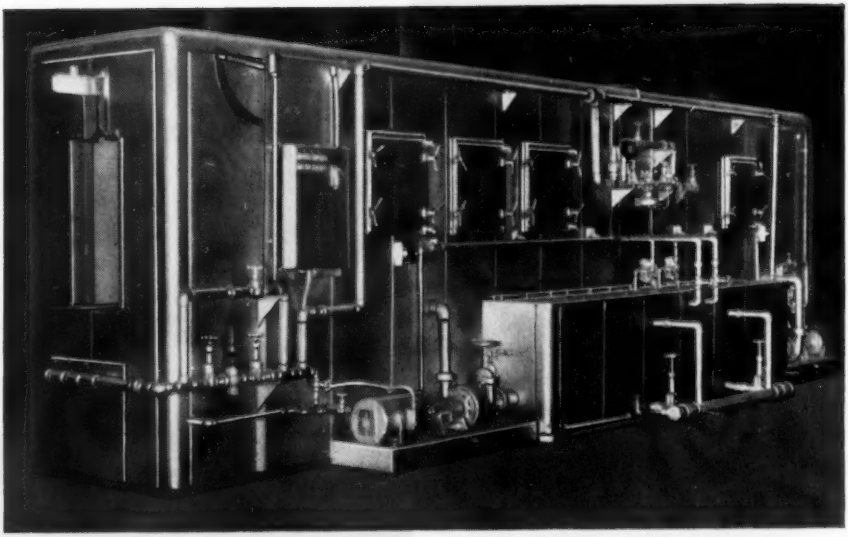
Painting Products Before Forming Page 40

Industry Thinking: A Report from the A. E. S. Convention Page 70

New Developments Page 84

Table of Contents Page 5

Finishes on metal products



shining example of CLEANING EFFICIENCY

Cincinnati **monorail wash, rinse & blow-off machine**

for automotive parts

featuring . . .

- Completely Piped . . . ready for installation
- Insulated . . . for air-conditioned building
- Removable Steam Coils . . . easy maintenance
- Special Access Doors . . . water-tight

Installed in a big, new midwestern automatic transmission plant, this Cincinnati machine cleans an impressive variety and quantity of impeller covers and turbine assemblies.

In addition to a long list of the standard Cincinnati Cleaning features, it is equipped to provide extra savings . . . in installation, production and maintenance.

Cincinnati Cleaning & Finishing Machinery is designed specifically for your production problems, giving substantial savings over the life of the machine. Request a no-cost, no-obligation survey of your cleaning requirements . . . present or future. Write:

Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

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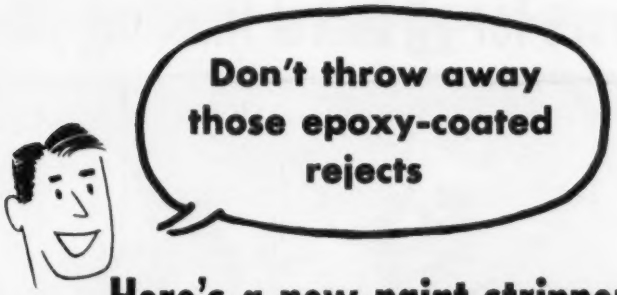

Here's a new paint stripper that will save them

Do you scrap perfect metal parts that have been imperfectly coated with epoxies, vinyls, polyesters and other hard-to-strip paints or lacquers?

In the last few months, users of Oakite Stripper S-A have eliminated many such losses. Here's what some of them say about it:

CALIFORNIA: An aircraft manufacturer tested many strippers on an epoxy designed to resist attack by hydraulic fluid. Finally found that Oakite Stripper S-A is "the only one that safely strips this paint from anodized aluminum."

NEW YORK: A camera maker coats flash bulb reflectors with black vinyl paint outside and aluminum paint inside. "Stripper S-A is the fastest ever used on our rejects."

OHIO: A maker of toy pistols had trouble stripping alternate coats of lacquer and metallized aluminum. Now "Stripper S-A does it amazingly fast and remetallizing is completely satisfactory."

CALIFORNIA: A producer of metal furniture uses Stripper S-A to remove clear epoxy from plated parts. Chemist says "This is the best stripper on the market."

ALABAMA: A hardware maker had trouble stripping lacquer from brass door knobs. Oakite Stripper S-A now does the work in "less than 1/5 the time taken by any other stripper."

NEW YORK: A manufacturer of business machines tested several strippers on various finishes on steel and aluminum. Verdict in favor of Stripper S-A was: "It's doing a wonderful job."

FREE Write Oakite Products, Inc., 20 Rector St., New York 6, N. Y., for complete information on Oakite Stripper S-A.

In our 50th year

SPECIALIZED INDUSTRIAL CLEANING

OAKITE

MATERIALS · METHODS · SERVICE

SCIENCE

Technical Service Representatives in Principal Cities of U. S. and Canada

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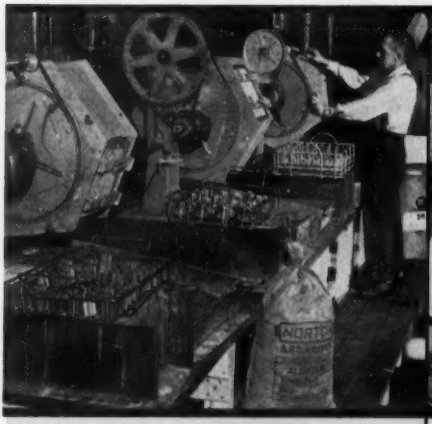
Money savers for all barrel finishing jobs



Small bench barrels with 7 cu. ft. capacity in production line operation. Alundum Tumblex "T" Abrasive is used for finishing irregular shapes.

A 4 cu. ft. capacity production barrel being unloaded after finishing operation. Thirteen cu. ft. production barrel shown in left background.

For finishing any part . . . in any barrel, large or small . . . there's an exactly right type and size of Norton TUMBLEX abrasive*

For lower costs in deburring, descaling and finishing parts to close tolerances, be sure to choose:

- *The right barrel equipment, available in a wide range of types and sizes.*
- *The right Norton TUMBLEX abrasive — made in four entirely different types, each in many different sizes and each engineered to add the "Touch of Gold" that brings lustre and boosts profits in finishing the widest variety of parts.*

Send samples of parts you finish — large or small, simple or intricate to our Sample Processing Department. We'll barrel finish, return samples, and tell you exactly the methods and abrasives you need to improve product quality and cut costs.

NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

G339

NORTON
ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS
Abrasives • Grinding Wheels • Grinding Machines
Refractories

BEHR-MANNING DIVISION
Coated Abrasives • Sharpening Stones
Pressure-Sensitive Tapes

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Announcing...

3 NEW WAYS TO CUT YOUR BUFFING AND POLISHING COSTS

STEVEN S 58 L LIQUID TRIPOLI

An outstanding *all purpose* liquid tripoli suitable for buffing all non-ferrous metals including die castings, copper plate, brass, and aluminum. Your *best* bet for low-cost, high volume metal finishing.

STEVEN S "NO-NUBBIN" FALSE BOTTOMS

Now . . . most STEVENS compounds are available in "NO-NUBBIN" false bottom containers. These money-saving packages are supplied in three sizes, 2″x2″ – 2″x4″ – 2″x6″ – and mean big economy in your buffing and polishing operations.

STEVEN S 27 L LIQUID TRIPOLI COLORING

The *best* liquid tripoli coloring on the market today, new STEVENS 27 L gives very high color and is readily cleaned. Another big advantage in 27 L Liquid Tripoli is its consistency in viscosity.

USE COUPON BELOW TO GET MORE INFORMATION ON THESE NEW STEVENS PRODUCTS

BRANCHES:

BUFFALO CHICAGO DETROIT CLEVELAND
DAYTON NEW HAVEN SPRINGFIELD (OHIO)

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

FREDERIC B. STEVENS, INC., 1800 18th St., Detroit 16, Michigan
Tell Me More About:
☐ 58 L Liquid Tripoli ☐ "No-Nubbin" False Bottoms
☐ 27 L Liquid Tripoli Coloring ☐ Have a Stevens Representative Call

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FIRM _____
ADDRESS _____ CITY _____ STATE _____

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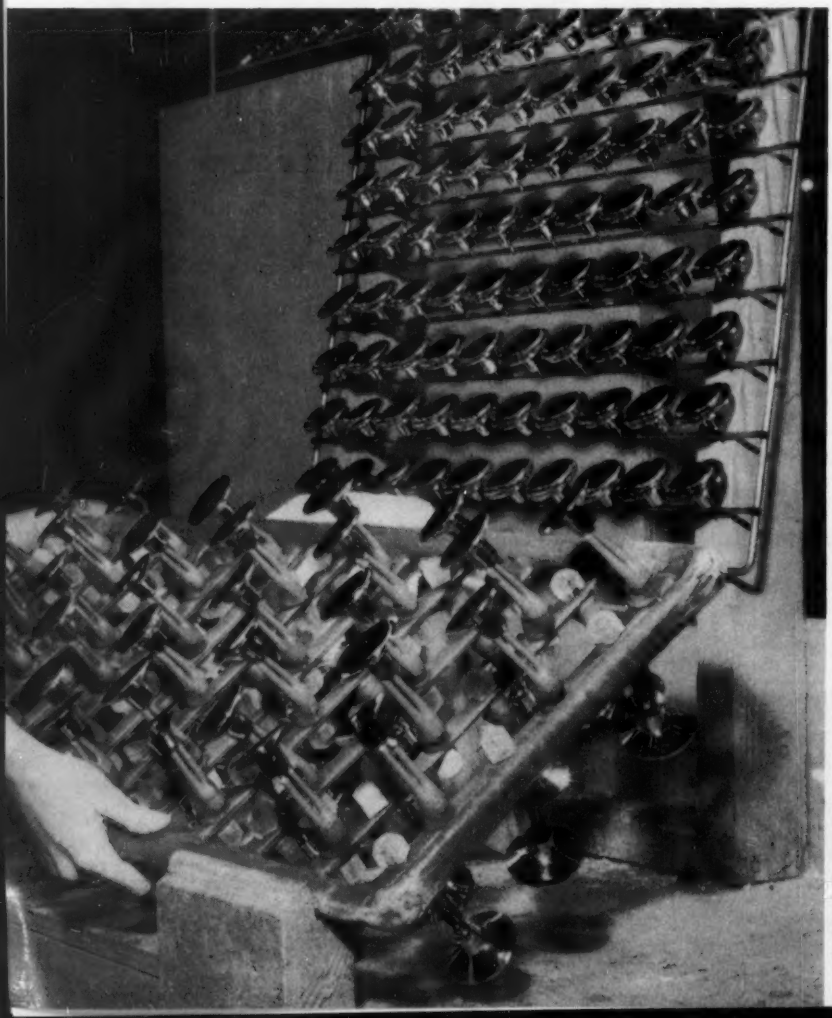
Unique new brightener for zinc and cadmium plated parts has been develope by Federated: CONMAX, a conversion coating for plated finishes from brilliant to iridescen provides corrosion resistant film to zinc and cadmium plate. Other high quality, low-co brighteners from Federated: ZIMAX for all types of zinc plating, still, automatic, and barrel CADMAX for cadmium plating; NIMAX, highly concentrated brightener for nickel barrel pla ing. These brighteners undergo rigid competitive tests before approval for sale. This als applies to Federated's complete line of plating anodes and nickel salts. It's safest when yo specify plating supplies from Federated Metals Division of American Smelting and Refinin Company, 120 Broadway, New York 5, N. Y. In Canada, Federated Metals Canada, Ltd Toronto and Montreal.

FEDERATED METALS DIVISION OF



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products finishing

Vol. 22 No. 9 June, 1958

FEATURES IN THIS ISSUE:

31 New Equipment and the "Hard Sell" • *Editorial*

32 How to Produce High-Quality Zinc Chromate Coatings • *By Joseph Stella*

38 A Single-Coat Anti-Corrosive System

40 An Easy Way To Paint Complex Shapes

44 How to Plate Selectively with a Stencil Mask • *By Ralph A. Botosan*

48 Porcelain Enameling Pots and Pans • *By Gerard H. Poll, Jr., Associate Editor*

52 A Better Finish for Compressor Valves

58 Electrochemistry and the Plater: Part IV • *By Fred G. Brune*

70 A Report on the 45th Annual Convention, American Electroplaters' Society

6 Advertising Representatives

DEPARTMENTS:

54 Finishes that Aid in Appearance and Utility
84 New Equipment, Materials, Processes
129 Product Literature
135 Classified Advertising
136 Finishing Clinic
140 News of the Finishing Industry
157 Meetings of Interest to Finishers
158 The Finishing Touch
160 June Advertisers' Index

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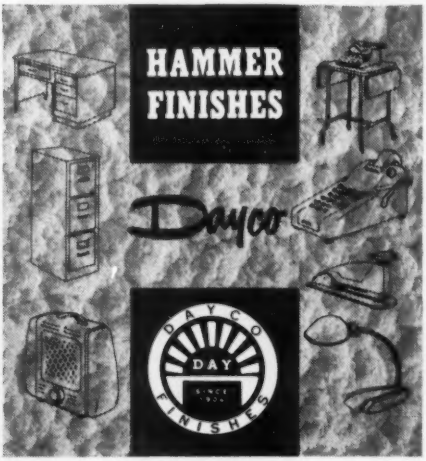
contents

Published monthly with two issues in March and copyrighted (1957) by Gardner Publications, Inc., 431 Main St., Cincinnati, Ohio. Printed in U.S.A. Accepted as controlled circulation publication at Cincinnati, Ohio.

For more data on advertisement on opposite page, circle 307 on Postpaid Card

ADD SALES APPEAL



For uniformity of pattern, depth of gloss, toughness, chip resistance; all features that help *make sales*, specify Dayco Hammer Finishes—baking or air dry. Backed by more than half a century of experience in producing fine production finishes, Dayco finishes have a quality and performance reputation you can depend upon.

We have or will produce for you, the special finishes your production calls for.

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& COMPANY
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products finishing

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★ ★ ★

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ALSO AVAILABLE IN WIDE SWING MODEL VRROW

Wide swing construction, with extended bearing housings and spindles, provides additional working space for large, bulky pieces.

Cost reduction is the need of the day — Write for catalog.

Hammond OF KALAMAZOO "Good Machinery Since '82"

Hammond Machinery Builders INC.

162 DOUGLAS AVE. — KALAMAZOO, MICHIGAN

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fostoria INFRARED SYSTEM

radiant heating news

to help manufacturers improve production operations

Get these 5 answers before you buy infrared ovens today...

Q Have you chosen the right type of infrared heat?

Just as gas, electricity and oil offer a choice of fuel in convection ovens, various types of infrared heat sources are available for radiant type ovens. Clear lamps . . . quartz lamps, quartz tubes . . . metal rods . . . all have distinct advantages depending on application, heat rating desired, processing speed and often, cost.

One is right for *your* purpose. The advantage of dealing with a supplier experienced in *all* types is obvious. Fostoria has the advantage that comes from being the pioneer in manufacturing radiant equipment, with skill and know-how to help you choose the right type of infrared.

Q Is your supplier unbiased in his recommendations?

Your experience in purchasing any kind of equipment tells you that getting a truly unbiased opinion from a company making only *one of many types*, is rather unlikely. So it is with manufacturers in the infrared field. Many concentrate on one type of radiant oven.

Today, Fostoria is the one firm making equipment that accommodates *all* practical and accepted sources of radiant heat. No heat sources are made at Fostoria. Consequently, no axe to grind.

Q Will your oven be engineered for your job?

Like a carpenter who attempts to build a boat, even an ordinary sheet metalsmith can build an infrared oven. But one thing is sure, neither boat nor oven will be the fine piece of equipment that gives the satisfaction you want.

Designing and constructing an efficient, economical infrared oven involves (1) selecting the proper heat source, (2) determining correct oven shape, (3) laying out proper interior, (4) applying the right amount of heat, (5) providing suitable controls and accessories. To get the highest efficiency possible at minimum operating costs, all of these factors are considered before Fostoria engineers the radiant oven best for your needs.

Q Is your supplier soundly established?

Let's face it, all of us have more confidence in the recommendations of a doctor whose shingle is aged with practice —and a bank with substantial assets. So it is similarly reassuring to know you are buying an infrared oven from a company with integrity. One who will back up your purchase 100%.

Supplying infrared ovens to thousands of users over the past 20 years, Fostoria is the kind of financially sound, and highly rated corporation you will find it rewarding to deal with.

Q Can you get service after the sale, too?

Whether buying a machine tool, lift truck or radiant oven, often the *service* you will get is quite as important to consider as the purchase itself. Fostoria established a nationwide network of trained engineers to give top-notch service *before and after the sale*. That means proper installation—and continuous performance with economy.

Send for a free copy of "Radiant Heat—Applications Unlimited" —our 20-page illustrated booklet on infrared ovens. If you include data on your applications we will gladly include recommendations in our reply. Write to Department 622.

THE FOSTORIA PRESSED STEEL CORPORATION • FOSTORIA, OHIO

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FREE *new* BOOKLET *tells how to get* BETTER PAINT ADHESION

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TURCO PRODUCTS, INC.
6135 South Central Ave., Los Angeles 1, Calif.

Please send me your free phosphating booklet and ready reference chart.

NAME_____

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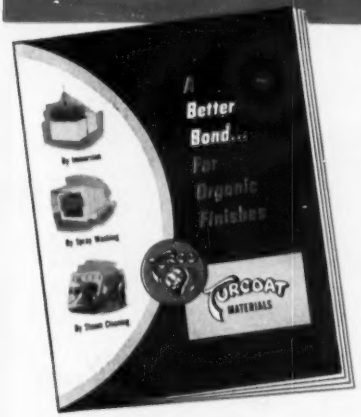

Complete PHOSPHATING Reference Chart Includes:

- Description of phosphating
- Diagram of how phosphating holds paint to metal
- Illustrations of what phosphating can do
- Types of coatings available
- Recommended uses
- Applicable Government Specifications
- Methods of application and equipment requirements
- Metals to be used on
- Coating weights
- Detailed operation cycles

Here... in the free Turcoat phosphating booklet... is the best solution to any paint adhesion problem. This new booklet describes the *complete* line of Turcoat materials—the coating compounds that assure *permanent* paint adhesion, slash rejects, require less complicated controls and are more economical to buy and use.

Only Turco offers a truly full line of government approved coating materials for use in *any* conceivable processing set-up prior to the use of organic finishes. Only Turco offers a staff of 160 technically trained representatives located in all parts of the country to give immediate 'round-the-clock service. No wonder Turco is adding new phosphating accounts at a phenomenal rate. There are many reasons why, when it comes to *paint adhesion*, more and more industrial concerns are turning to the Turcoat line. The Turcoat booklet lists them all.

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Chemical Processing Compounds
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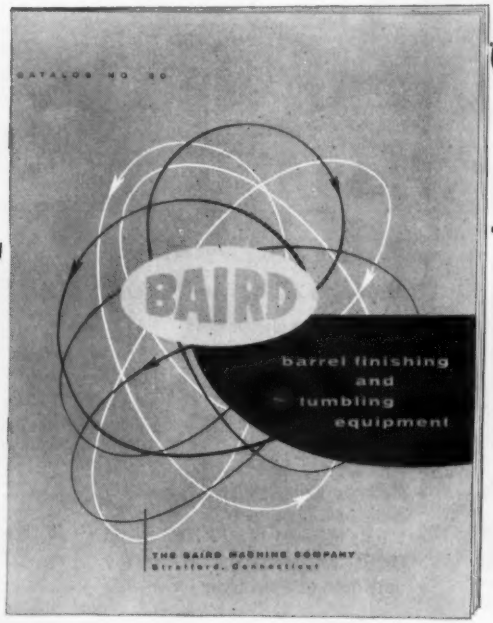
methods and machines can

IMPROVE PRODUCTS . . . SPEED WORK . . . CUT COSTS



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BAIRD Service
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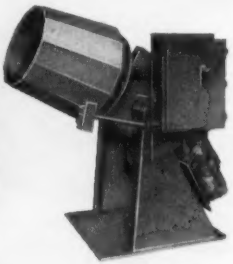

POLIACTION
ELECTRATILT MODEL
(To J.I.C. Stds.)

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NEW "MULTIPACT" MULTIPLE HORIZONTAL MACHINES
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Write Dept. PF. ***Ask BAIRD About It!***

BAIRD

Builders of High Production Machinery Since 1846

THE BAIRD MACHINE COMPANY, STRATFORD, CONNECTICUT

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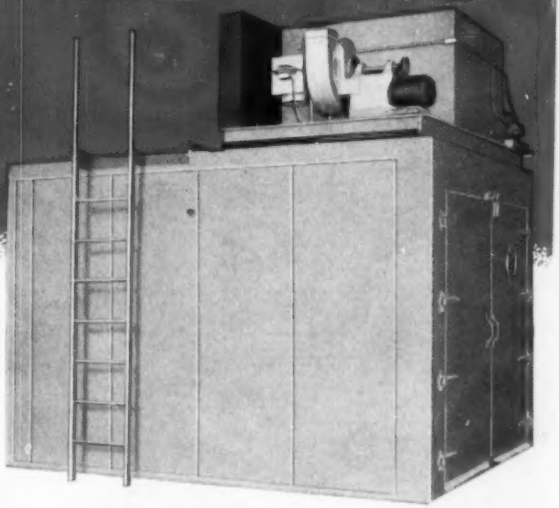

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All 3 Types

- INSTANT HEATING
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World's **first** successful U-tube **ACID** Heater—Guaranteed to outperform and outlast all other quartz heaters.

TYPE "GN"
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"Multi-Blade", Metal-sheathed **ALKALI** Heater—Portable, burn-out proof, easy mounting, long life.

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...you'll get it with Glo-QUARTZ!
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WILLOUGHBY, OHIO
Phone Willoughby 2-5521

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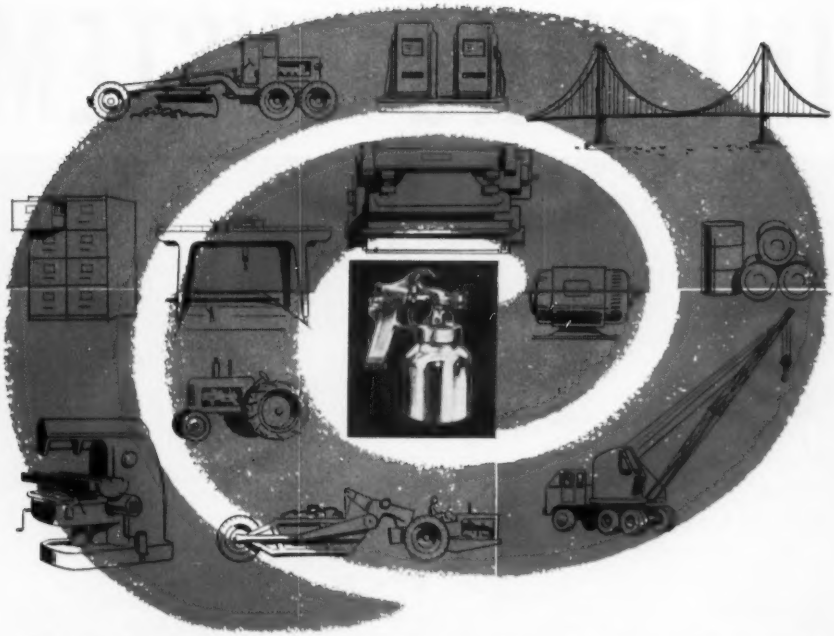

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with new Isophthalic based resins

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ORONITE CHEMICAL COMPANY

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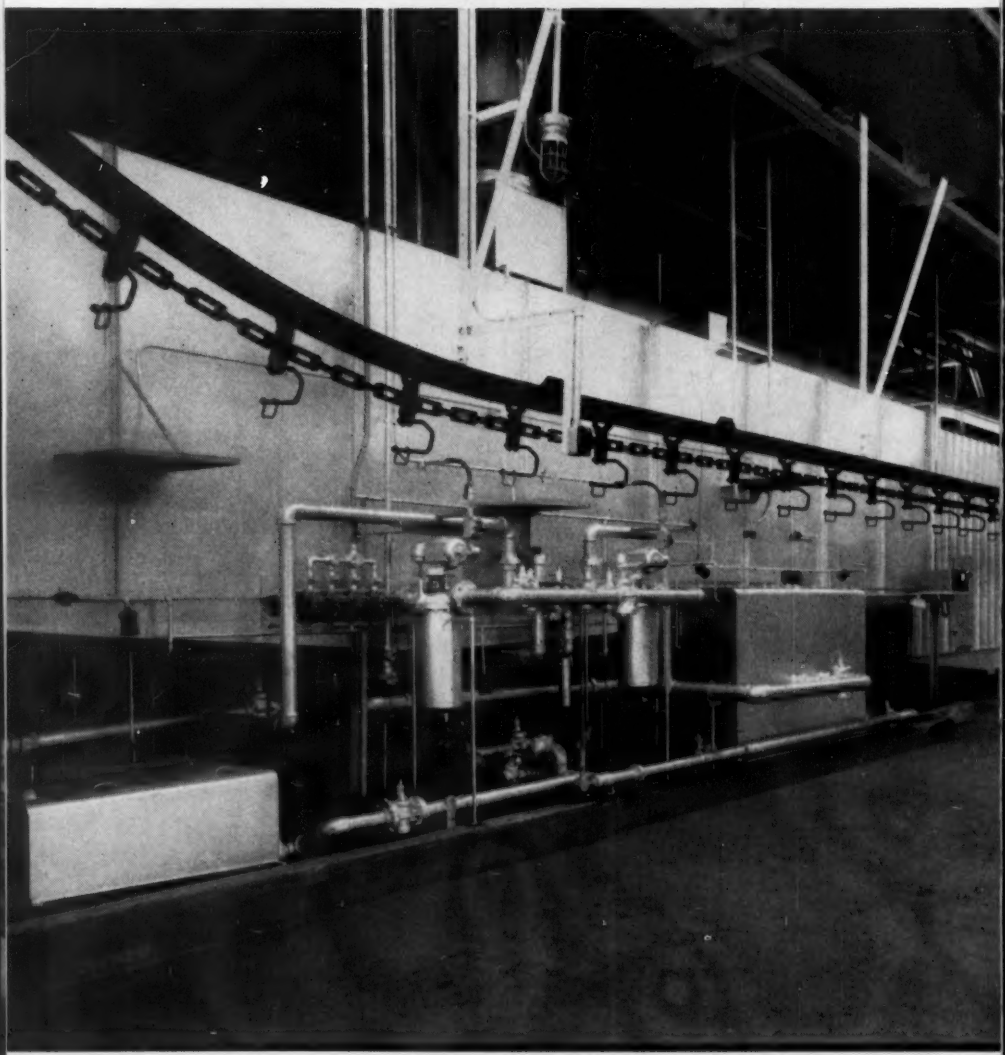
FINISHING SYSTEMS



Pictured above is a modern Mahon Flow-Coating Machine equipped to maintain paint at a constant temperature and viscosity . . . it is part of a Complete Mahon Finishing System designed especially for painting Hoods, Fenders, and Miscellaneous Small Parts in a Ford Motor Company Assembly Plant in Atlanta, Georgia.

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

Complete Mahon Finishing System Provides Facilities for Metal Cleaning and Rustproofing, Drying, Spray Painting, Electrostatic Coating, Flow Coating, and Finish Baking!

The illustration at the left shows a specially designed Mahon Flow-Coating Machine . . . it is one unit of equipment in a complete Mahon Finishing System installed in an automobile assembly plant.

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THE R. C. MAHON COMPANY · Detroit 34, Michigan

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See Sweet's Plant Engineering File for Information and Typical Installations or Write for Catalogue A-658

MAHON

NIKOLAS

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- COPPER

- *you'll have to make it yourself*

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BROOKLYN 11, N. Y.

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FREE *trial!*

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SPRAY BOOTH COMPOUND

GUARANTEED NO COST TO YOU

(unless you are completely satisfied)

CHECK THESE ADVANTAGES:

- No Foam Problem
- Clean Booths
- Perfect Paint "kill"
- No Curtain Build-up
- No Clogged Nozzles
- Less Manual Clean-up
- No Booth Rusting
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There are no hazards involved—Irilac is non-fuming, non-toxic, and requires no special fire prevention measures.

THE PROCESS

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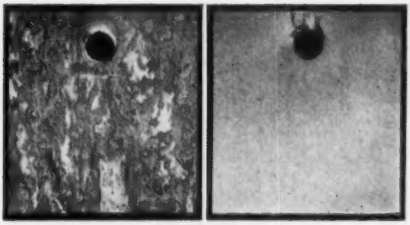
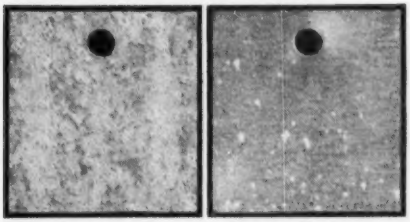
The resulting coating is clear, transparent, thin yet durable. It has excellent water resistant properties, and can be rubbed, handled and subjected to rough treatment. The surface to which Irilac has been applied is not altered—in fact, the transparent coating brings full tone to colored surfaces and clarity to iridescent surfaces. The water-thin physical characteristic of the solution means that the coating provides protection in recessed areas that are difficult, if not impossible, to protect with other methods.



STEEL PANELS: bare (left) and coated with Irilac (right) after 8-hour salt spray.



ALUMINUM PANELS: bare (left) and coated with Irilac (right) after 168-hour salt spray.

WHERE IRILAC CAN BE USED

Irilac #1000 can be applied to *any* metal—wet or dry—treated or untreated. All metals can be processed in *one* operation in the same solution. It can be applied in conjunction with any process—over Iridite, anodized, phosphated surfaces, black oxide, etc. Surfaces treated with Irilac provide a good base for paint.

APPLICATION ADVANTAGES

No other process or material available for the protection of metals offers all the application advantages found in new Irilac #1000.

1. It can be applied to *any* clean metal simply by dip, brush or spray. No special equipment is required.
2. Saves time — just apply and dry — no reaction time required.
3. No hazards involved—no exhaust or special fire protection equipment is required. Irilac is non-fuming and non-toxic.
4. Saves space. Presents no disposal problem. Low in first and final costs.

Because of its versatility and complete safety, Irilac has unlimited uses. For example, it will protect aluminum furniture, brass hardware and fixtures, steel parts of all types, zinc castings, etc. In fact, any base metal or plated surface, or those treated with electrolytic or chemical post-treatments, can be improved or enhanced with Irilac.

IRILAC #1000 MAY BE THE ANSWER TO YOUR PROTECTION PROBLEM **Our development staff will be glad to work with you to determine the significant benefits Irilac can offer you. Simply send us some parts and let us show you what Irilac can do. No obligation, of course.**

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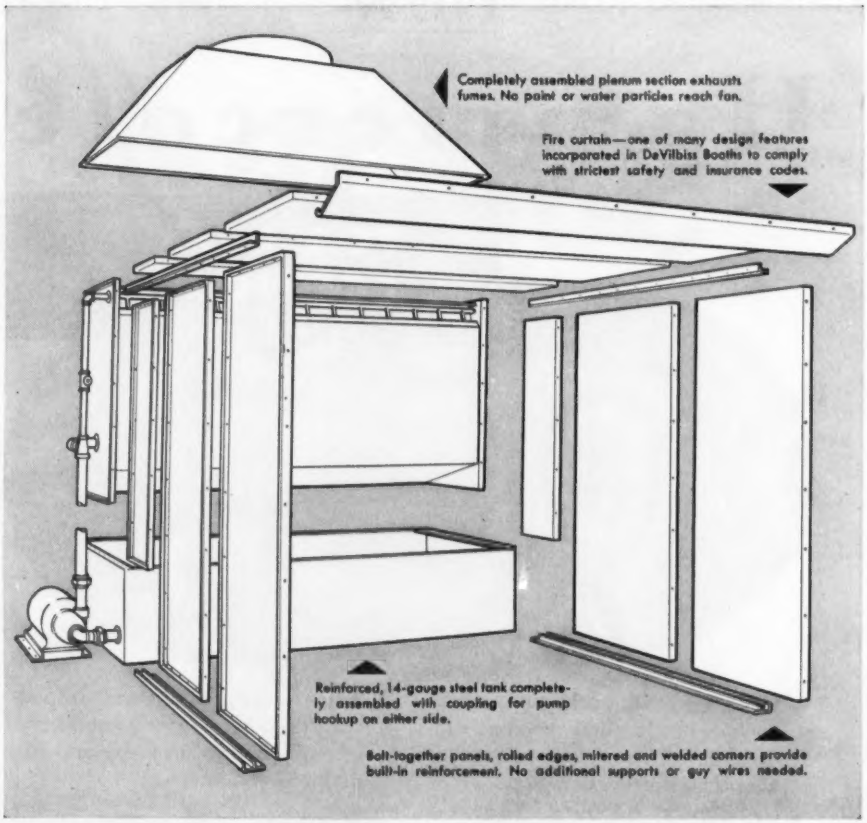
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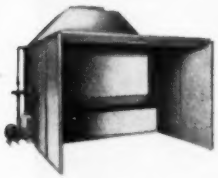

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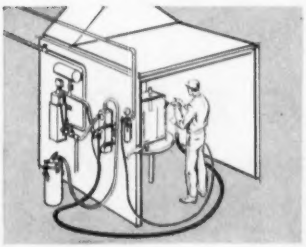

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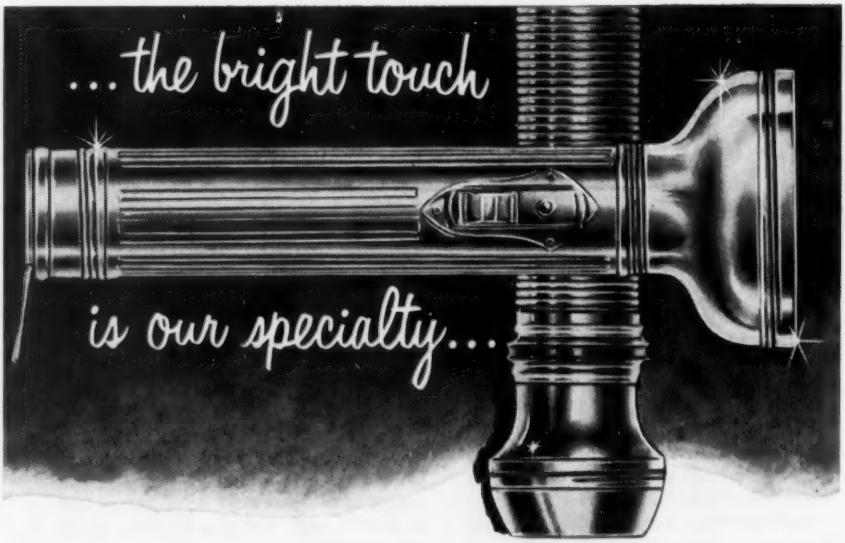

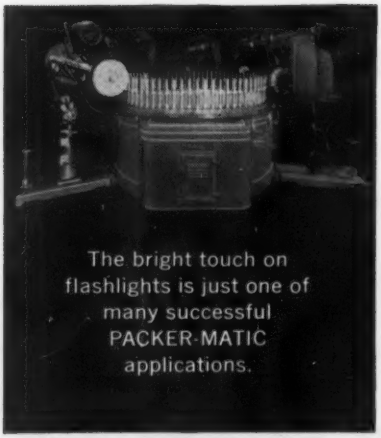

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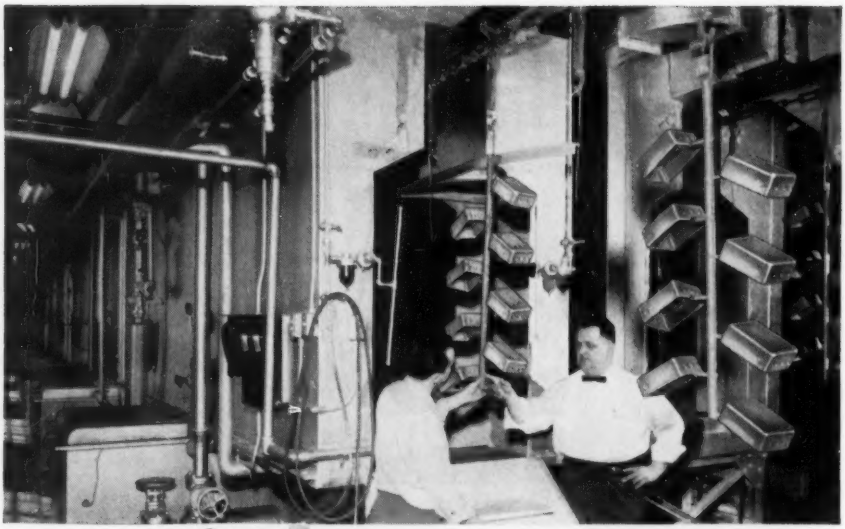

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New Equipment and the "Hard Sell"

We hear a lot about the "hard sell" these days. In simple terms, it means that manufacturers—whatever they make—are out there pushing their wares with all they've got to carve out their share in a highly competitive market.

A finish is an important part of the "hard sell." First, if it is an outstanding finish, it improves appearance and durability of the product—two important factors in the sale of any product. Secondly, if the finish is produced in the most economical manner, total cost of the manufacturer's product may be reduced so that he can sell his product at a price that's hard to beat.

To produce a finish that meets these qualifications, however, new equipment is often required. It's a "must" because it is needed to produce a higher quality finish or do it more economically—or both.

Sure—an old machine can often produce a beautiful finish. But how much does this finish cost compared to one produced with a machine where the touch of a button sets off a cycle that ends with the finished product?

Then there are some equipment setups that just can't be used to take advantage of recent advances in technology. Take acrylic finishes. They combine properties that make for an excellent appliance finish. Used on automobiles, they stay glossy longer without polishing. But many of them require higher baking temperatures and/or longer cycles. Result: the old baking oven won't do the job any more.

Then there's a new philosophy on chromium plating for exterior service. It says that a thicker plate of chromium will give added corrosion protection. But deposition of this thicker plate requires equipment modifications—greater power capacity, cooling equipment. These are just two examples of many. Take a look around your finishing installation. You'll find similar opportunities to do a better job and/or cut costs.

Remember—when efficiency falls and your competitor is doing a better job of finishing because he has improved equipment, you're paying for the new equipment whether you have it or not.

Gerard H. Poll, Jr.

—ASSOCIATE EDITOR

How to

Produce High-Quality Zinc Chromate Coatings

A study of physical and chemical factors that affect the production of chromate coatings on zinc . . . tips on operating techniques and pitfalls to avoid . . .

By **JOSEPH STELLA**
Director of Research
Promat Division
Poor & Company

Protecting and decorating zinc surfaces—these are common operations in many finishing shops. Chromate conversion coatings have become indispensable to finishers who perform such tasks. They can be used as a final finish, or as a prepaint treatment. Proper methods of application are important in getting the most durable coatings.

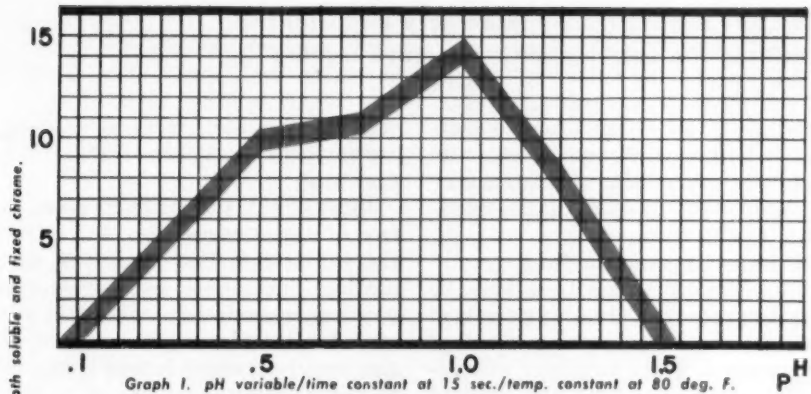
Used as a final finish, chromate coatings protect from corrosion and impart color: depending upon the formulation of the chromate coatings and the way they are applied, it is possible to produce clear coatings on zinc as well as blue tints, iridescent yellows, browns, olive drabs, blacks, and shade variations of these colors.

When chromate coatings are used as a prepaint treatment, they have three primary purposes: they produce a passive surface that prevents undesirable reactions between the paint film and the metal; at the same time, they convert the surface to one that makes the paint adhere better; they also prevent the spread of under-film corrosion if the paint film is scratched off, exposing bare metal.

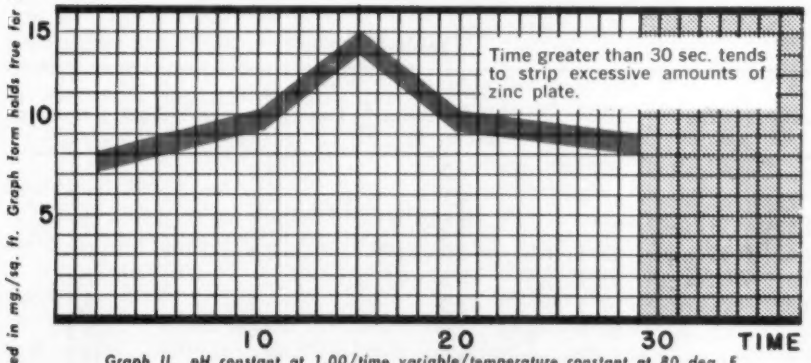
Chemical Composition

Chemically, the baths used to produce chromate conversion coatings are acidic solutions of chromium salts in water. Additions of organic or inorganic acids as activators may or may not be necessary.

The bath deposits chromium-containing compounds on the zinc. These compounds are the result of complex oxidation-reduction reactions taking place at the interface of the metal and the solution.

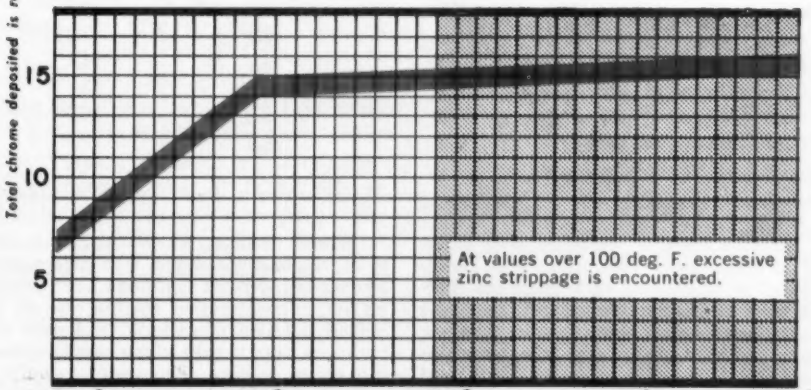


Graph I. pH variable/time constant at 15 sec./temp. constant at 80 deg. F.



Graph II. pH constant at 1.00/time variable/temperature constant at 80 deg. F.

Total chrome deposited is recorded in mg./sq. ft. Graph form holds true for both soluble and fixed chrome.



Graph III. pH constant at 1.00/time constant at 15 sec./temp. variable.

"The zinc surface itself can be very important in obtaining the best possible chromate coating."

Chemically, the compounds deposited are hydrated chromous, chromic and dichromate salts, existing either singularly or in various combinations of the three.

Influence of Zinc Surface

The zinc surface itself can be very important in obtaining the best possible chromate coating. Surface preparation, grain structure of electrodeposited zinc, and presence of occluded brighteners in zinc plates are important considerations.

Cleaning

First of all, the surfaces must be free of oils, greases, dirt, and so on; therefore, it is best to follow zinc plating operations with chromate coating immediately. If parts are stored after plating, they must be thoroughly cleaned before going into the chromate dip.

Table I

pH	Time	Temp.	Average Soluble Chromium* mg/sq. ft.	Average Fixed Chromium** mg/sq. ft.	Average Total Chromium mg/sq. ft.
.5	15 sec.	80° F.	6.0	4.0	10.0
.75	15 sec.	80° F.	6.7	4.3	11.0
1.00[1]	15 sec.	80° F.	8.9	5.2	14.1
1.25	15 sec.	80° F.	5.0	3.8	8.8
1.00	2 sec.	80° F.	4.5	3.3	7.8
1.00	5 sec.	80° F.	5.0	3.5	8.5
1.00	10 sec.	80° F.	6.0	4.0	10.0
1.00	15 sec.[2]	80° F.	8.9	5.2	14.1
1.00	20 sec.	80° F.	6.6	4.3	10.9
1.00	30 sec.	80° F.	4.8	4.0	8.8
1.00	15 sec.	60° F.	4.0	3.0	7.0
1.00	15 sec.	80° F.	8.9	5.2	14.1
1.00	15 sec.	100° F.	9.0	6.3	15.3
1.00	15 sec.	120° F.	7.6	9.1	16.7
1.00	15 sec.	150° F.	7.8	9.8	17.6

[1]Optimum pH [2]Optimum Time

*Soluble chrome, which consists mainly of hexavalent chromium, was determined by immersing each chromate-coated part in boiling water until complete color leach was obtained, and then using standard photometric analysis methods. Ammonium persulfate was used as the oxidant and 1,5-diphenyl-carbohydrazide as the color developer.

**Fixed chrome, which consists mainly of trivalent chromium, was determined by immersing parts that have been leached out in determining soluble chrome in a 0.8N solution of sulfuric acid until attack was seen to take place evenly across the entire surface. Photometric analysis was then used to determine chromium, using the same oxidant and color developer.

Grain Size

Secondly, the grain size of plated zinc is important. Zinc plates accept chromate coatings best if they are fine grained, close knit, and deposited in parallel planes. Such plates rinse more easily, with less chance of plating solution entrapment, which would later cause leaching of the chromate deposit. By producing a fine-grained, even deposit, there is less chance of the chromate solution stripping the zinc down to the basis metal in areas where the plate is thin (chromate solutions remove a small amount of zinc in the process of depositing the coating). Research also shows that the chromate solution attacks a fine-grained surface more evenly, leaving an unbroken chromate film.

Occluded Brighteners

The presence of occluded brighteners in zinc plates is detrimental to the production of a continuous chromate coating. This has been proved by making use of the fact that some chromate films absorb certain water-soluble dyes. The dye is absorbed by the chromate film where the film is present, but not by bare zinc. In this manner, the dye shows visually just where the film has been deposited and where it has not. Such tests have shown that zinc electrolytes containing high percentages of occluded-type brighteners deposit zinc plates that cause "misses" (areas where no chromate is deposited) up to 20 per cent of the total plated area, when treated in a standard chromate solution.

Factors Influencing Deposition

A number of physical and chemical factors affect the type and amount of chromate coating that is deposited. Although these factors affect the deposition of all the various types of chromates, the influence of a given factor is not equal for all systems. Each chromate differs, and will deposit a heavier or lighter film than another chromate would under the same conditions. And optimum conditions differ for the various types.

Anion-Cation Balance

Chemically, the anions present in a given chromate coating solution, their type, molecular weight, and concentration exert the largest single influence on the type and amount of chromate coating produced. Anions influence the rate of corrosion of the zinc surface, and correspondingly accelerate or impede the deposition of both hexavalent and trivalent chromium; thus it is important that each system be tested carefully to ensure even depletion of the anions and cations during the life of the bath. This eliminates trouble encountered from depositing undesirable chromium compounds because of an unbalanced solution.

Influence of pH, Time, Temperature

Table I shows the influence of time, temperature and pH on the amount of chromate coating deposited. These data were obtained by taking the average values resulting from tests of ten chromate solutions. These solutions had similar operative limits with respect to time, temperature and pH required to deposit a desirable film.

Graph I shows the upper and

"... it is important to take note of the type of chromate being deposited—soluble or fixed."

lower limits of pH, as well as the optimum — 1.0. At both the lower limit (0.1) and the upper limit (1.5) no chromate film is deposited. Close control of pH is very important.

Graphs II and III show that the operator of a chromate coating tank has more freedom when it comes to time of immersion and bath temperature. Although there are optimum times and temperatures for a given chromate, these factors are not critical. There are no points, as there are with pH, at which deposition abruptly ceases altogether. There are, however, maximum times and temperatures, above which excessive stripping occurs. Since time and temperature are not critical, they are usually determined by using the most practical time and temperature that will produce adequate deposits for a specific job. From the graphs and Table I it can be seen that the optimum operating conditions for these chromate baths are as follows: pH, 1.00; immersion time, 15 seconds; temperature, 80-100 deg. F.

While the total amount of chromate deposited is the fundamental consideration in these studies, it is also important to take note of the type of chromate being deposited—soluble or fixed. This is especially important in marine atmospheres, since it has been shown that the fixed, or trivalent chromium is the sole remaining protective agent after the soluble hexavalent chromium has been leached out by the weather. These studies have shown that a minimum of 25 micrograms per square inch of hexavalent chromium is imperative for adequate corrosion resistance. To obtain maximum resistance, however, it is necessary to control the variables so as to deposit adequate total thickness as well as the highest possible ratio of trivalent to hexavalent chromium.

Effect of Agitation

Agitation of the chromate bath is important in producing films of maximum brilliance and uniform color and composition. Agitation aids in producing brightness because it produces a chemical polishing effect on the zinc plate; this is because the constant movement of the solution near the zinc surface has the effect of maintaining a lower pH near the zinc; thus the solution attacks the zinc at a faster rate. By presenting a fresh solution of constant pH at the metal-solution interface, production of a film that has uniform color and constant composition is aided by agitation.

Importance of Transfer Time

Transfer time from the chromate dip tank to the first rinse tank should be as short as possible. If the part is not rinsed immediately, the chromate remaining on the surface of the part will continue to react with the zinc and excessive stripping will occur. Delay in rinsing will also cause the initial chromate film to be dissolved, after which another chromate film will be deposited at a higher pH. The lat-

ter film will have poor lustre, poor adherence and inferior composition.

Rinsing

Adequate rinsing is important. All ionizable salts must be removed from the surface. If allowed to remain, these salts would ionize in humid atmospheres and cause premature failure.

Leaches

Leaches are used primarily to dissolve the hexavalent chromium compounds and leave a "clear" chromate, composed mostly of trivalent chromium. Since the advent of single-dip clear chromate baths, which deposit a film composed predominantly of trivalent chromium, this practice is not as common as it used to be. To get a clear film with maximum protective properties, however, the leach is still used. This is because the chromate baths that deposit hexavalent as well as trivalent chromium still deposit greater amounts of trivalent chromium than is deposited by the one-dip chromate bath.

Leaches should be buffered, and should not have too high a pH. Control of immersion time and temperature of the leach bath are also important, so as to avoid dissolving *both* trivalent and hexavalent chromium. Here, as in applying the original chromate coating, transfer time and proper rinsing are important.

Drying Time

Proper drying time is important in getting maximum service and benefit from a chromate coating. This is due to the fact that these films contain water of hydration. Until this water of hydration has had time to escape, the film is softer and more easily damaged. It also has less resistance to corrosives. Salt spray testing has shown that a minimum of 48 hours at room temperature is sufficient to expel the water. Baking is not recommended, since the water released is pushed through the film too fast, with the possibility of causing pinholing.

Adapted for publication in PRODUCTS FINISHING from the November, 1957, issue of Promat's Progress, *monthly publication of the Promat Division of Poor and Company, Waukegan, Illinois.*

★ ★ ★

Early Nickel-Plating

Nickel was used for plating as early as 1843. However, owing to the high price of the metal at that time and the difficulty of obtaining it in a sufficiently pure state, it was not until about 1870 that nickel plating was established as an industry.

"Well, aren't you a most happy fella today . . ."

A Single-Coat Anti-Corrosive System

Corrosion engineer reviews properties and applications for wash primers, holds out hope for a single-package, single-coat film that would give adequate protection from corrosion . . .

"Future developments may bring forth a stable *one-package* system that could be effectively applied in *one coat* at a film thickness adequate to serve as the *complete* anti-corrosive system." This was the note of hope for the future improvement of anti-corrosive systems that highlighted a talk given by L. R. Whiting before the recent San Francisco Meeting of the National Association of Corrosion Engineers.

Mr. Whiting, a corrosion engineer for Bakelite Company, a Division of Union Carbide Corporation, titled his paper simply "Wash Primers." In it, he explained the present status of both the art and science of formulation and use of wash primers. An abstract of the paper is presented below.

The term "wash primer" was coined by Mr. Whiting during World War II to designate a material that is at once a metal pre-conditioner and an anti-corrosive primer. The dual-purpose coating was developed during the war, with patents assigned to the Secretary of the Navy.

Wash primers based on Bakelite polyvinyl butyral resin, Corrosion Engineer Whiting explained, serve to improve adhesion of subsequently applied coatings, and at the same time passivate the metal and protect it from corrosion. They are applied as a single thin coating.

While one-package wash primers have been developed already, these coatings are suitable only for less severe applications; for top corrosion resistance, the two-package (but one-coat) system is still the number-one choice. The latter type is used in both marine and chemical atmospheres. Use is not limited to air-dry systems, however. Wash primers are now being used as part of coating systems that require baking at elevated temperatures.

The two-package system consists of a base grind and an acid diluent that is added just before use. The mixture can be applied by brush, spray or dip on a variety of metals, ferrous and non-ferrous. It dries rapidly.

The resulting film has excellent adhesion and corrosion resistance, prevents or retards underfilm corrosion, upgrades the performance of subsequently applied coatings. "Film," in fact, is somewhat of a

misnomer, since the wash primer and the metal become integral parts of one another at the interface; any attempt to remove the wash primer results in partial removal of the metal substrate.

Mr. Whiting concluded his talk on a note of promise for the future of wash primers: the one-component, one-coat, corrosion-protective system that corrosion engineers hope to develop.

★ ★ ★

A Simple Aid to Pore-Free Plating

If finishers would take as many precautions in plating as they do in production paint finishing operations, the "pore problem" in plated surfaces would be about 80 per cent licked, according to research engineers at Wagner Brothers Inc., Detroit, Michigan.

Contrary to most opinions, they say, continuity of the plated coating on a steel part is more important than plate thickness. This is borne out in instances where thin coatings are applied to parts which are buffed prior to plating.

During buffing, the engineers say, the metal is flowed along the surface both from the pressure of the wheel and the compounds used, closing over existing pores. This reduces the chances of base metal oxidation, and increases the chances of producing a continuous plate.

Besides unconditioned metal, Wagner engineers say, continuity of plating is disrupted by improper chemical cleaning, air-borne dirt and contaminants man-invoked through careless maintenance work around the plating equipment. If steps were taken to overcome these sources of contamination, the finished work would have far fewer pores, the engineers state.

The biggest upsurge in plating quality during the past few years, they point out, was primarily a result of better cleaning.

Another boost in quality can be obtained simply, they believe, through good "housekeeping" practices—following the same practices of powder metallurgists, gage makers and those involved in applying paint finishes.

A Survey of Paint Application Methods

A series of articles on painting methods have been reprinted as a 64-page booklet.

Chapters in the report cover: 1) Use of the Spray Gun. 2) Conveyorized Spray Finishing; Automatic Spraying; Electrostatic Spray Painting. 3) Hot Spray; Airless Spraying; Steam Spray Painting; Spraying Catalyst Coatings. 4) Dipping Methods; Flow Coating. 5) Roller Coating; Tumble and Centrifugal Painting; Silk Screening; Aerosol Painting.

Reprints of *A Survey of Paint Application Methods* are available at 50 cents a copy. Write to PRODUCTS FINISHING, 431 Main St., Cincinnati 2, Ohio.

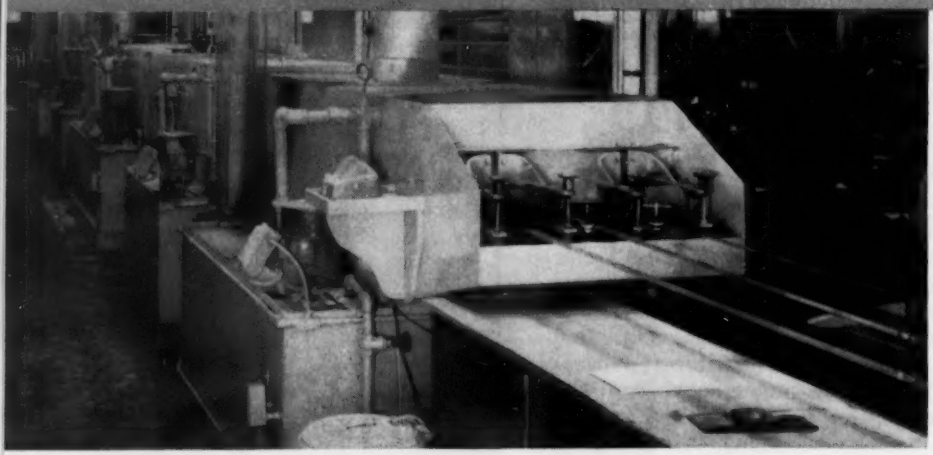
An Easy Way To Paint Complex Shapes

Continuous automatic roller coating machine paints flat stock with tight-adhering coating that isn't damaged by roll-forming into traverse rod and track sections . . .

An eastern manufacturer of drapery hardware has cut costs and increased production in its painting department. And getting adequate, even coverage on insides and curved surfaces of the complicated shapes produced in this plant is no problem, because the paint is applied before the sections are formed. It's done by roller coating flat coil stock and then roll forming the painted stock.

The whole job — from cleaning the metal through rewinding the finished stock—is done in one continuous operation by an automatic roller coating machine installed in the Wallingford, Conn., plant of Stanley-Judd, Division of the Stanley Works. The line was engineered

Fig. 1—Three steel coil strips are shown entering the cleaning and pretreatment section of the line. Pretreating the strip assures maximum adhesion needed to withstand forming.



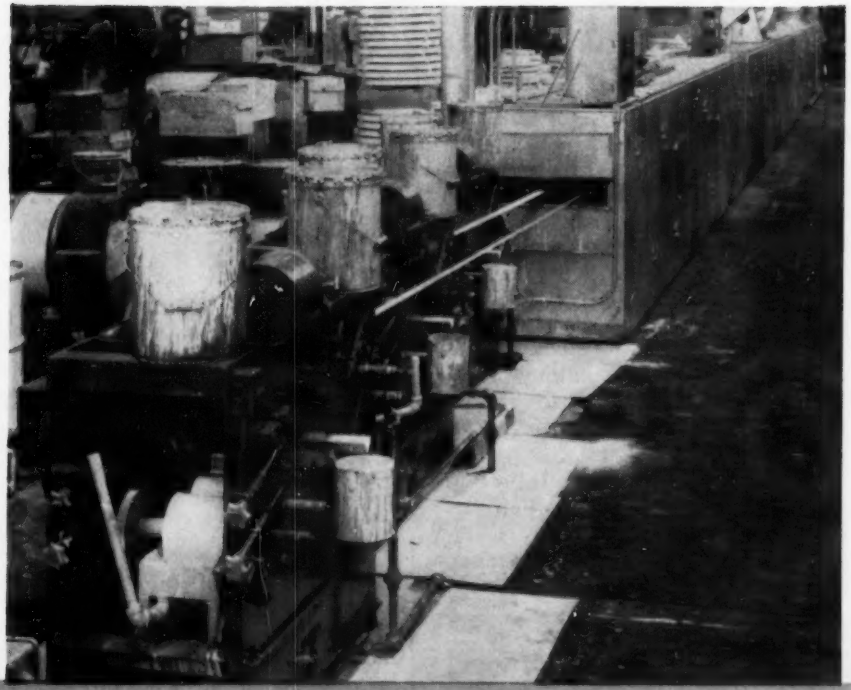


Fig. 2—Three roller coaters in the line at Stanley-Judd. Each coater handles one strip, coating both sides simultaneously. Painted strip then travels through the baking ovens.

by Gasway Corporation, Chicago.

The high-production machine handles three separate coils of flat stock (3½-inch maximum width, 0.015 to 0.040 inch thick) simultaneously. All three strips go through the same washers, pretreatment tanks, and baking ovens. But the painting is done by three separate roller coaters. This allows the company to apply three colors simultaneously, and each strip can travel at a different speed, so that various widths and gauges of metal can be painted at the same time.

Flat stock is brought to the roller coating line in a coil. It is mounted on reels, from which it "pays" into the line. A device called an accumulator "stores up" stock so that rolls can be changed without stopping the machine.

From the accumulator the stock feeds into a washing and metal-treatment machine. The metal is cleaned and phosphatized, chromated and rinsed to prepare the surface for painting.

Rinsing is followed by a trip through a drying oven, which removes all traces of moisture before paint is applied.

Roller-Coat Painting

The flat stock next travels into the roller-coat painting machine, in which paint is applied as the metal passes between paint-covered rollers. The coater applies a metered film to both sides of the stock. Paint film thicknesses are controlled to 8/10 mil on the outside and 2/10 mil on the inside.

From the coater the stock travels under tension to the baking oven. Baking time is determined by the speed of the line and the length of the oven.

At the end of the line pull-through rolls power the stock through the line and keep it under tension. Rewind reels collect the painted stock and recoil it. It is now ready to be formed.

Care taken in applying the finish so as to get maximum adhesion and toughness as well as care taken in forming operations allows the products to be shaped without damaging the paint film.

Fig. 3—Rewind units are staggered just as the coaters are. The painted stock is wound on these collectors, ready for subsequent roll forming into finished rod and track parts. (Photos courtesy Gasway Corp., Chicago, Ill.)

Coming Up: Profitable Reading

Future issues of PRODUCTS FINISHING will contain many valuable articles . . . the kind that tell the finisher how to do his job better, how other people have improved finishing operations. Look for these and other interesting articles in coming issues:

Planning and Operating an Industrial Waste-Disposal Plant

Large plant gets top results by installing waste-disposal facilities as an integral part of a new plating line . . .

Nuts and Bolts: Plating to Prevent Seizure

Results of experimental work undertaken to combat seizure problems encountered when high-chromium-content steels are used at high temperatures . . .

How to Make and Install an Air-Agitation System

A few simple rules that help in designing and installing an efficient air-agitation system in a plating tank . . .

Watch for these and other articles in PRODUCTS FINISHING, the Finishing Industry's most informative publication!

"WE LICKED OUR ANODIZING MIST AND SPRAY THE EASY WAY . . ."

ROBERT A. NYQUIST, CHIEF CHEMIST
THE ELECTRIC AUTO-LITE COMPANY
BAY MANUFACTURING DIVISION
BAY CITY, MICHIGAN

"In our aluminum anodizing operation, we were encountering excessive gassing from our 15-18% sulphuric acid solutions.* In addition, we were getting a severe sulphate build-up on our lead cathodes and copper bus which was hindering our current carrying capacities. We couldn't control this problem even with our push-pull ventilation, so we began looking about for an effective method of suppression. And we found it!

"With the addition of just *one pound* of Udylite 'Zero-Mist' per 1,000 gallons of anodizing solution, we now control sulphuric mist and hold the spray down to 2-3 inches from top of the solutions. This was checked by saturating filter papers with alkaline phenolpthalein solution and suspending the papers at various levels before and after the addition of 'Zero-Mist' (see inset). The addition of 'Zero-Mist' made necessary by dragout is easily determined by visual and nasal observations. This easily maintained additive is our simple solution to an otherwise difficult processing problem."

Using Udylite 'Zero-Mist' in the anodizing operations such as the Electric Auto-Lite installation, is just one more application for the versatile 'Zero-Mist' family. Let your local Udylite representative demonstrate the many time and money saving advantages of 'Zero-Mist' at your convenience. Call him now, or write direct to:

*Zero-Mist has proven satisfactory in Chromic acid solutions also.

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How to Plate Selectively with a Stencil Mask

A new approach to selective plating shows promise as a method for making printed circuits, decorations, identifying marks . . .

By **RALPH A. BOTOSAN**
Director of Research
The Electromark Corporation
Cleveland, Ohio

Selective plating, the process by which a metal is deposited on only certain areas of a surface, has a number of industrial uses. One of the most important recent applications is in making printed circuits. Another use for this process is in producing nameplates and ornamental designs (Fig. 1) by depositing a metal that differs in color from the basis metal. The method described herein also shows promise as a method of producing bi-metallics for semiconductors and electronic parts where fixed designs of different metals are required.

The idea is not new. Principles of plating through a stencil were mentioned by Michael Faraday more than 100 years ago. Past attempts to make use of the process, however, have not been too successful. Poor results were usually the result of trying to use a rigid mask and an immersion-type process.

Recent Developments

Briefly, the process now being used consists of depositing metals on selected areas by masking off the areas that are not to be plated, using a non-conductor. The non-conductor is a stencil with areas cut out where plating is desired. There is no immersion of the work, as in ordinary plating. Instead, some variation of "brush plating" is employed.

The Stencil

The most important component of this process is the stencil. Upon it depends the success or failure of the job. Other ways of masking off the areas that aren't to be plated have been suggested, but most of them are either more expensive than stencilling or do not produce details as well.

The use of specially prepared stencils offers a practical solution to many selective plating problems. The initial cost is low, techniques are relatively simple, and the stencil can be used repeatedly. It will produce fine details.

The material selected for a stencil must have certain properties.

First of all, it must be non-conductive. It must not be affected by electrolytes. The stencil material must be flexible, so that it will conform closely to the surface being plated. And it must be a smooth material with properties that make it cling to the surface without the use of an adhesive. This prevents electrolyte from seeping under the stencil at the edges of the cut-out. Finally, the material must have enough dimensional stability to hold the details of the stencil in place. Materials are now commercially available which meet these qualifications.

A recently developed stencil used to reproduce lines and designs accurately is prepared by a photographic process. The stencil material is an open-mesh sheet of fibers covered with a photo-sensitive resin. The photo-sensitive resin is such that exposure to ultra-violet light causes it to become insoluble in certain solvents.

To make a stencil, then, film with a photograph of the desired design is placed over the stencil material and the two are locked in a photographic printing frame. The frame is placed under an ultra-violet light until the correct exposure is attained.

The stencil is removed from the frame and placed in a pan of solvent, which dissolves the unexposed areas and leaves only the cellulose-type fibers to hold the unexposed (now open) areas together. The fibers are readily wetted by the electrolyte, so that they do not interfere with deposition.

The completed stencil is less than 0.003 inch thick. It is very pliable and conforms readily to any flat or curved surface. Pressed against the metal surface to be selectively plated, it masks off those areas

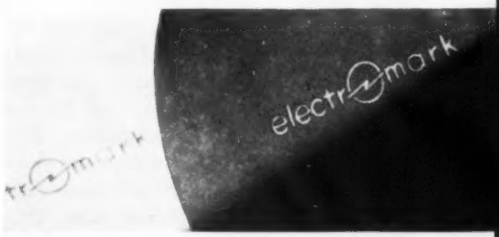

Fig. 1—Special stencil used for selective plating is a non-conductive material that is very pliable, so that it clings to the surface being plated. Open areas are reinforced with multi-filament fibers to improve dimensional stability of stencil.

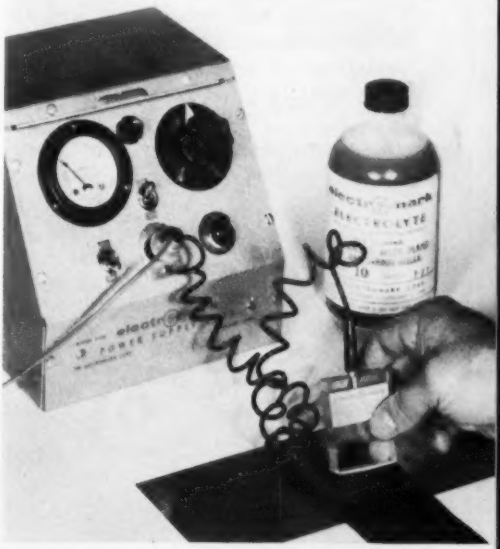

Fig. 2—Stencil is placed over the surface to be plated, then felt pad saturated with electrolyte is connected to power source. Work is connected to opposite terminal. By pressing the pad over the stencil, metal is deposited through open areas.

where plate is not to be deposited.

The Plating Process

Plating itself is accomplished by almost any variation of brush plating (Fig. 2). Connected to the negative terminal, the metal to be plated becomes the cathode. The anode is made by facing an electrode with some absorbent material, such as felt. After connecting this anode to the positive terminal, it is dipped into the electrolyte. By pressing the anode over the stencil, metal is deposited in the open areas (Fig. 3). The time required depends on the electrolyte and the current density. Optimum time for a given job will become evident after a little experimentation. Other variations of brush plating will produce equally good results.

Fig. 3—Bright nickel being plated selectively through a stencil applied to a rocker pad. Note sharp lines. (Photographs courtesy The Electromark Corporation, Cleveland, Ohio.)

Making Printed Circuits

One method of making printed circuits is based upon selective plating through a stencil. To produce a printed circuit in this manner, make a stencil with open areas in the shape of the circuit. Deposit an acid-resistant metal (such as gold) on a copper surface through the stencil. Etch the circuit board in the conventional manner. Plated metal protects the copper from being dissolved where the open areas of the stencil had been, leaving the printed circuit intact.

A less common method of making printed circuits is to make a plastic panel conductive with a silver spray solution and then plate through the stencil. When the conductive material is removed, the circuit remains.

Etching

By reversing current, using the same process, it is possible to selectively etch. The work is made the anode, and a brush plating stylus is the cathode in this case, so that metal is removed in the open areas.

AC Mark

Oxides, such as the well-known black oxide, can be selectively plated onto metals using the combination of a stencil and brush plating. It is a simple way of producing a design or mark.

To produce such a finish, alternating current must be used. One lead is connected to the work being plated, the other to the electrode, as in direct-current applications. On contact, a black finish appears on the exposed areas.

The reason for the blackening effect is quite interesting. Since alternating current is applied, metal is alternately plated and removed

at rapid intervals. When the current is traveling from the work to the electrode, metal is being removed; this metal travels up into the electrode wrapping and reacts with the electrolyte, forming stable metal oxides. These same particles plate onto the metal surface on the return cycle, when the current is flowing from the electrode to the work. The process continues until the marking area is covered with a dense film of black oxide. The oxides formed are stable ferrous oxides, not ferric oxides. The part so treated should be cleaned and oiled after marking.

The type of electrolyte is an important consideration in producing an "a.c. mark." To avoid the introduction of another metal (which would cause galvanic action) salts used in formulating the electrolyte must not convert to stable metallic compounds.

Selective plating through a stencil has many possibilities. It should offer a challenge to anyone willing to experiment.

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METAL CLEANING DATA. Information on eight Wyandotte Metal Cleaners is given on specification sheets. These data sheets for the Wyandotte line of metal cleaners include practical use-directions; a description of advantages; product description; and container data.

The sheets available cover these Wyandotte Products: Expray (AP), an all-purpose, rust-inhibiting spray cleaner; No. 75, a dry acid compound for removing light oily soils, iron sulfide and amine residues; W.L.G., a heavy-duty soak cleaner for steel; No. 20, a heavy-duty, solvent-emulsion cleaner and degreasing compound; F. S., an anhydrous, heavy-duty reverse

current electrocleaner; Spray-Altrex, a non-etching non-foaming cleaner for aluminum; Burnek 22, for barrel burnishing most metals; and Industrial No. 38, a heavy-duty all-purpose cleaner.

Copies of the Wyandotte data sheets may be secured by writing Industrial Sales Department, **Wyandotte Chemicals Corporation,** Wyandotte, Michigan.

★ ★ ★

Preparation of Protective Coatings by Electrophoretic Methods. By A. C. Werner and others, Vitro Corporation of America, for the Wright Air Development Center, U. S. Air Force. 53 pages. Price, $1.50. (Order PB 131062 from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Electrophoretic methods were tested in an effort to find a method for the preparation of protective coatings that would make molybdenum suitable for continuous, long-term operation in an oxidizing atmosphere at 1800 to 2000 deg. F.

Porcelain Enameling Pots and Pans

A photo story showing how a West Virginia manufacturer of hollow ware applies porcelain enamel . . .

By GERARD H. POLL, JR.
Associate Editor

Porcelain enameling at Fletcher Enamel Company in Dunbar, West Virginia, is a high-production operation. This company makes all types of porcelain enameled cooking utensils, and has been turning out high quality ware that is sold under well-known brand names for many years.

★ ★ ★

Automatic dipping machines, some of them designed by the company's own engineers to take care of special problems and apply an even, run-free finish, can turn out as many as 26 pieces per minute. Photographs on the following pages show how the company has arranged its operations, and some of the techniques and equipment used.

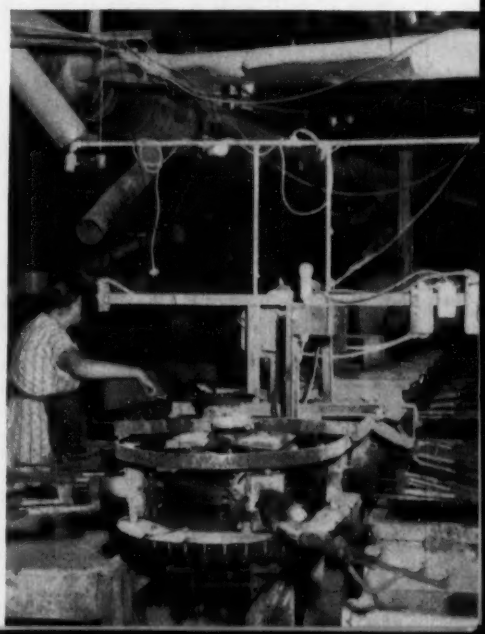


Fig. 1—Roasting pans come down a skate-wheel conveyor (right) from Fletcher Enamel's storage room. Pans are made from 26-gauge hot-rolled and cold-rolled steel. Arriving at this point, they have been formed, washed and dried. Woman on right loads the pans onto arms of the automatic ground coat dipping machine's conveyor (foreground). Mechanism on the conveyor guides the arms so that pans dip into enamel (a speckled dark blue enamel in this case); company-invented device then takes the pans through a series of twists and turns so that runs and sags in the enamel film are eliminated and an even ceramic coating of the proper thickness stays on the pan.

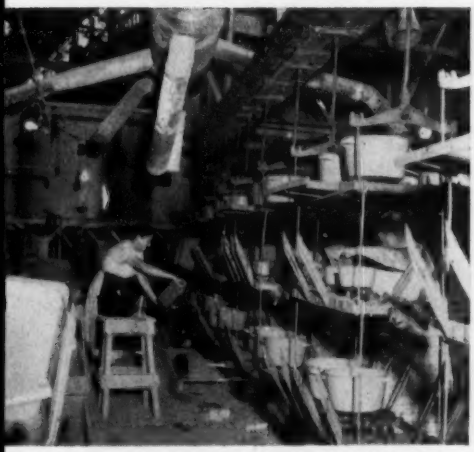


Fig. 2—Woman at left center carefully removes pan from the dipping conveyor and transfers it to conveyor (right) that takes pans to dry-off oven. Enamel is dried for 15 minutes in a gas-fired oven that is kept at 400 deg. F. Pipes and ducts overhead help to keep workers more comfortable in the summer by bringing in air from outdoors.

Fig. 3—Ground coat of porcelain enamel is fired in a Ferro 9-burner U-type gas-fired furnace. It takes four minutes at 1580 deg. F. to do the job. After cooling sufficiently to be handled, parts are removed from the furnace conveyor and placed in carts like one in the foreground. Cart is pushed to the finish-coat line, where woman in center foreground places parts on the dipping-machine conveyor. Level of white porcelain enamel in the dip tank (right foreground) is kept constant by allowing it to overflow into tank on right. Fletcher Enamel makes its own white porcelain enamel; beginning by making frit, completing the process by milling the glass white titanium enamel to a fine slurry. Enamel is agitated in tank on far right, pumped back into dipping tank. Women in the left background are unloading this conveyor and decorating the pans while they are still wet. To do this, pans are carefully removed from the conveyor and placed on the turntable. The decorator then dips her fingers into a pan of red enamel and skillfully spins the wet pan while holding her fingers against the top rim so as to make a red stripe. No red gets on the rest of the pan. This line produces 12 to 19 pieces per minute. Company operates a second porcelain line similar to this one.

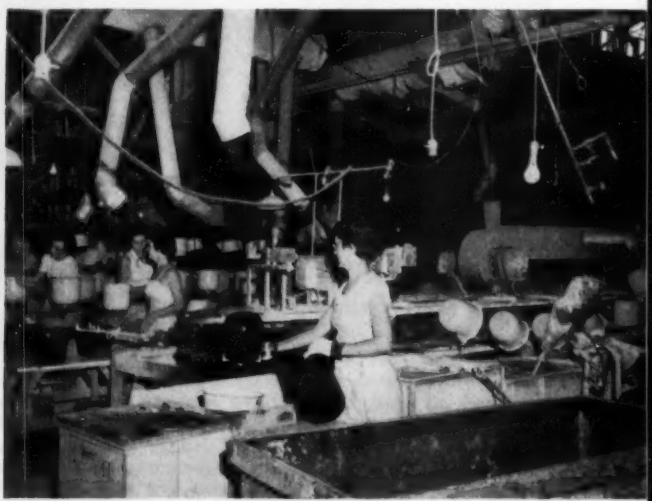
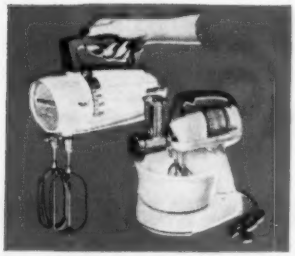


Fig. 4—Some pans are decorated after the enamel has been dried, before firing. Worker shown above does this quickly with her porcelain-covered fingers, can paint an attractive, even red band around the top rim of the pan in one seemingly effortless motion.

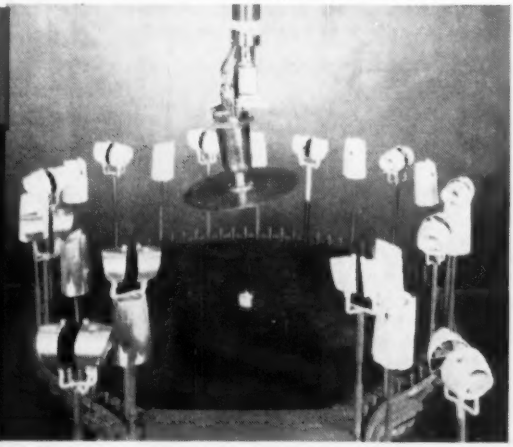
Fig. 5—After finish-coat enameling, pans go to the dry-off oven, then to firing furnace. They are dried for 15 minutes at 400 deg. F., fired for three minutes at 1480 deg. F. Thickness of the porcelain enamel coating after firing is 0.008 inch. Workers above are unloading the chain conveyor that carries the finished ware from the furnace. They inspect the pieces, then place them on a belt conveyor that transports finished products to an adjacent room for packing and storage. (PRODUCTS FINISHING Staff Photographs.)



DORMEYER MIXERS are painted with RANSBURG NO. 2 PROCESS

. . . and high quality standards are easily maintained with Electrostatic Spray Painting

Aluminum and zinc die castings of the Dormeyer Mixers are painted uniformly as the parts make a loop around the RANSBURG disk in the job painting plant of Enameled Steel & Sign Co.



● Enameled Steel & Sign Co. is able to serve many customers like Dormeyer, for their Chicago job painting plant is equipped with modern and efficient finishing facilities for producing high quality, high volume painting.

Electrostatic spray painting has practically replaced all other methods here, for the flexibility and near 100% efficiency of the Ransburg No. 2 Process enables Enameled Steel to serve many manufacturers of a wide variety of products. And, this with a comparatively small labor crew!

Today—with Ransburg No. 2 Process—Enameled Steel is realizing more than 60% paint savings over former hand spray. Rejects have been cut to less than 1%, for the Ransburg No. 2 Process applies a uniform, high quality finish never before obtainable with old-fashioned painting methods.

THINK OF WHAT 60% PAINT SAVINGS WOULD MEAN IN YOUR OWN FINISHING DEPARTMENT

Whatever you manufacture, if your production justifies conveyorized painting, you should look into the savings and improved quality which can be yours with Ransburg Electro-Spray. Let us tell you about the complete Ransburg services, including the test painting of your products in our laboratories.

Ransburg ELECTRO-COATING CORP.

Indianapolis 7, Indiana

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Fig. 1—Flapper valves before (left) and after barrel finishing. Jagged metal and burrs are in evidence on blanked edge of valve at left. Valve at right shows uniform radiusing.

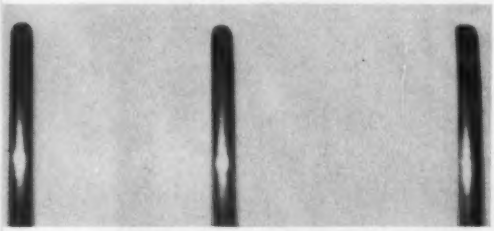


Fig. 2—End views of flapper valves after radiusing. Note irregular radius on edge of valve at extreme right. This can be corrected by extending finishing cycle. (Photos courtesy Roto-Finish Co., Kalamazoo, Mich.)

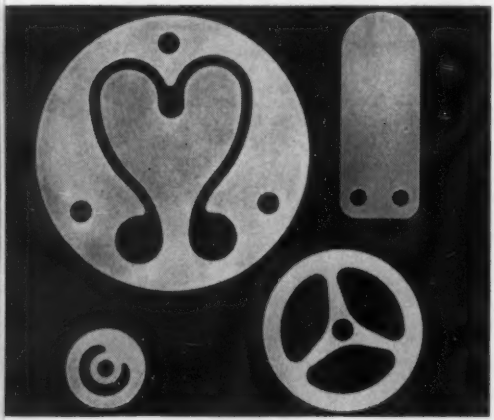


Fig. 3 — Uniform, satin-like surface is produced on complex valves by barrel finishing.

A Better Finish for Compressor Valves

Flapper valves used in refrigerator compressors must be free of jagged edges and burred, stressed metal, must have a uniform radius on the finished edges. This is one way to improve fatigue resistance and make sure the valves will stand up in service.

Both burrs and stressed metal, if not removed from the parts completely, will result in stress risers that cause or allow fatigue cracks to build up in the metal. This condition shortens valve life, contributes to early operational failure. In addition, there's the risk that unremoved burrs will fall off while the compressor is operating and cause malfunction of the equipment itself.

Engineers at Roto-Finish Company, Kalamazoo, Michigan, manufacturer of barrel finishing equipment and supplies, recently barrel finished a large run of such parts.

The valves processed are stamped from sheets of tough Swedish steel, range in thickness from 0.05 inch to 0.015 inch. Jagged edges and small burrs are present when the valves are removed from the stamping die (Fig. 1). Some of the

Barrel finishing methods prove to be the answer to deburring stamped compressor valves for refrigerators . . . large quantities produced economically . . .

stampings are complex in shape (Fig. 2), which makes the finishing job more difficult.

The parts were deburred and radiused satisfactorily in conventional barrel finishing machines, using compound made specifically for this operation, and media sized to do the job as quickly and efficiently as possible without lodging in recesses.

The time cycle required for deburring and radiusing the valves is comparatively long in most cases. Although all burrs are gone within a few hours after rotation begins, complete radiusing takes more time. In some cases, when it is necessary to put a full radius on the internal curves of more complex parts, barrels are kept running as long as 60 hours per load. Checks are made periodically to determine the minimum time required to do a specific part.

Radiusing tends to occur more readily on the external surfaces or edges of the parts. The radius generated in barrel finishing is not a true radius: it tends to curve more sharply toward the center of the piece. If the stamping die is not in good condition, the radius will tend to be irregular (Fig. 2). This slight irregularity can be blended in by extending the finishing cycle, however.

A medium speed of cylinder rotation was used in deburring and radiusing the valves. Water level was kept even with the surface of the mass.

The Swedish steel from which the flapper valves were made is tough. It presents no problem in producing a good finish, since the abrasive media tends to polish and improve the surface rather than mar it.

★ ★ ★

Evaluation of Approaches to the Study of the Physical Nature of Metallic Surfaces. By M. K. Testerman, University of Arkansas for Wright Air Development Center, U. S. Air Force. 71 pages. Price, $2.00. (Order PB 121971 from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.)

The object of this research was to develop a method of measuring the microscopic roughness of a metallic surface. The method must determine the accessible surfaces and be applicable to adhesive polymers.

Various approaches were examined and an instrument is proposed which makes use of the de Broglie matter waves. Fifty-KV helium ions bombard the specimen at a small angle. The reflected ions are magnified through an ion microscope which detects a signal proportional to the quantity of impinging ions. The surface of the metal is scanned and the detected signal, after being amplified, is recorded as a function of scanning. By comparing the results with a standard pattern of roughness, absolute measurements of surface fluctuations to the desired order of magnitude are possible.

Finishes that Appearance

A *LIGHTWEIGHT ROOFING MATERIAL developed by Ewart Steel Roofing Co., Pittsburgh, is 28-gauge Jones & Laughlin galvanized steel stamped to resemble tile. After installation, roof is sprayed with special mastic and ceramic granules — in any of 35 colors.*

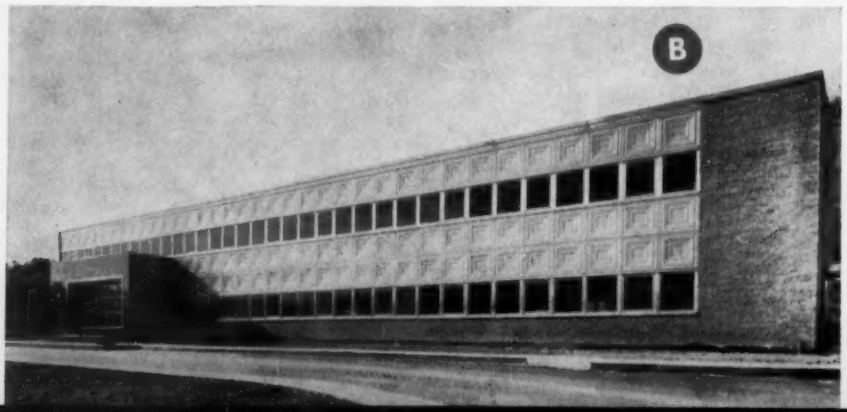
B *MODERN OFFICE BUILDING built for Allegheny Ludlum Steel Corporation in Leechburg, Pa., is faced with four-foot-square 20-gauge type 202 stainless steel panels. Non-reflective finish gives soft, glowing appearance to panels. Trim members are satin finished.*

C *CALORIC GAS WASTE DISPOSER is protected by a durable coat of porcelain enamel.*

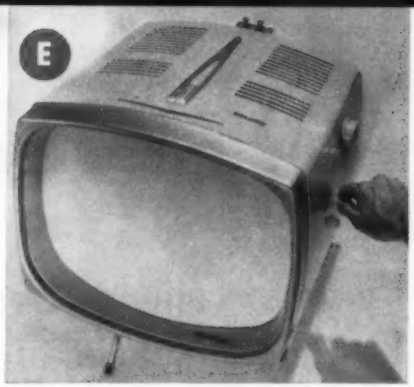
D *MOVABLE MOTEL can be built in a hurry. When a new expressway comes through, the attractive buildings can be disassembled, quickly moved to new, more profitable location. Prefabricated units made by Capp Manufacturing Company, Minneapolis, owe their portability to lightweight color-anodized aluminum exterior walls made by Reynolds Metals Company.*

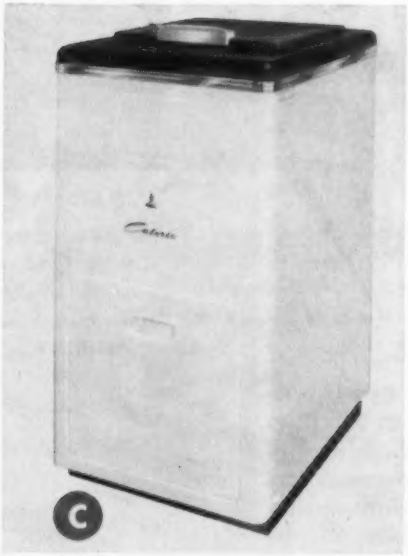
E *RCA TELEVISION SET features attractive brass-colored bezel and trim parts. Brass-colored finish based on Bakelite epoxy resins was developed by Rexton Finishes, Inc., has good resistance to scratching, peeling, discoloration, dulling, tarnishing.*

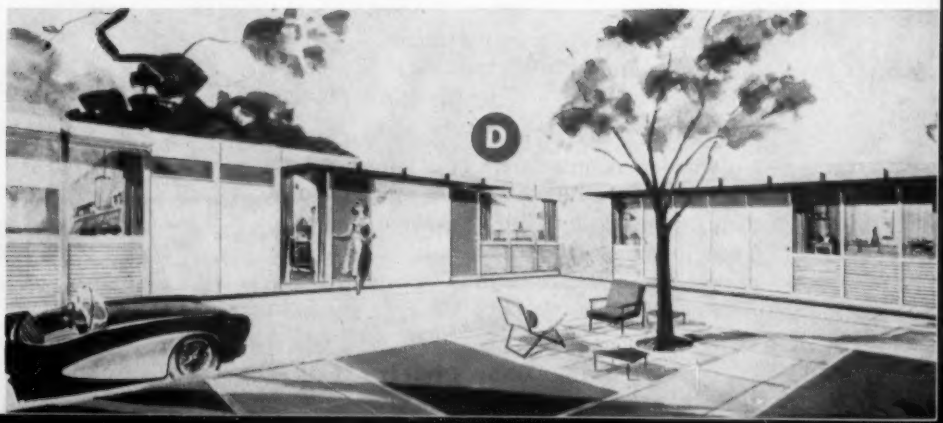
F *WATER COOLER made by Sunroc Corporation, Glen Riddle, Pennsylvania, is made more attractive and durable by use of gray hammertone finish on the cabinet exterior.*



Aid in and Utility







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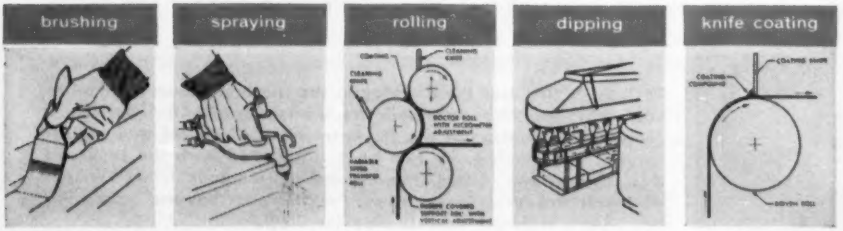

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Electrochemistry

Part IV

By FRED G. BRUNE
Quality Manager
Chrysler-Operated Naval
Industrial Reserve Aircraft Plant

Metals, Solutions and Cells

As we have seen in previous installments of this series of articles, there is a potential difference at the point of contact between a metal and an ionic solution. This potential difference is called the *electrode potential*. When two electrodes are connected by an external conductor, a *cell* is produced, the E.M.F. (electromotive force) of which is the algebraic sum of the two electrode potentials (allowance must be made for the sign of each potential difference).

A *voltaic cell* consists of two electrodes combined in such a manner that when they are connected by a conductor, such as a metallic wire, current flows. In principle, such a cell is a means for converting chemical energy into electrical energy.

The *Daniell cell* is a classic example of a voltaic cell. It consists essentially of a strip of zinc immersed in an aqueous solution of zinc sulfate and a strip of copper immersed in copper sulfate solution, the two solutions separated by a porous partition. When two such electrodes are connected by a wire, electric current flows. The E.M.F. or voltage of such a cell is the algebraic sum of the two electrode potentials —the sum of the potential of copper to copper sulfate and the potential of zinc to zinc sulfate in this case.

The E.M.F. of a cell is somewhat dependent upon the concentration of the electrolytes as well as the nature of the metals and solutions. The standard electrode potentials

FRED G. BRUNE has been active in the plating industry for more than 25 years. He attended the University of Cincinnati as a cooperative student in the Department of Chemical and Metallurgical Engineering. He has been associated with the Lockland Div., Electric Auto-Lite Company and Marion Industries, Division of Motor Products Corporation. For the past several years, he has held a staff position at Chrysler Corporation.

Mr. Brune is a past-president of the Cincinnati Branch, American Electroplaters' Society. As a member of the Detroit Branch, he gave a most successful course in Electroplating last year. Mr. Brune is a member of the Electroplating Course Committee of the A. E. S.

and the Plater

refer to 1-molar solutions. Increasing the concentration of copper sulfate in the Daniell cell increases the E.M.F., since this speeds the conversion of copper ions to atoms; reducing the concentration of zinc sulfate also increases the E.M.F., since this allows zinc atoms to go into solution and become zinc ions more rapidly.

It is possible to calculate the effect of concentration changes on the potential produced by a cell. Metallic nickel in contact with a one-molar ionic solution of nickel salts has a negative potential of 0.23. By increasing this concentration ten times, the voltage would change by 0.0295 volt, from 0.23 to 0.20.

The principal use of the standard electrode potential for the plater is in studying deposition of metals from solution, using an anode, a cathode and a current supply. In principle, we are reversing the action that takes place in a cell—we are converting electrical energy into chemical energy.

Suppose we place two electrodes in a copper sulfate solution and then connect one to the positive pole of a direct current supply and the other to the negative pole. We now have a simple plating setup, Increase the voltage gradually until copper deposits continuously. The voltage reading at this point tells us the *deposition potential* of copper from a copper sulfate solution — the lowest voltage at which continuous deposition occurs.

Actually the reading in this case will be about the same as the standard electrode potential for copper—we have just reversed the process. Then why have such a term as deposition potential? It's the same as electrode potential! The reason is that the two—deposition potential and electrode potential—are *not* always the same. Under certain conditions they differ.

Author's Note: *This material was used in a lecture course in Electroplating, given as a part of the educational program of the Detroit Branch, A. E. S. The lectures were designed to explain in simple terms the principles of electrochemistry, and demonstrate to the plater the usefulness of these principles. During the course each student was given a copy of "Fundamentals of Electrochemistry and Electrodeposition," by S. Glasstone, as a source of more extensive explanation of electrochemical principles.*

But before we discuss the exceptions to the rule, let's consider the metals and solutions that obey the rules. A number of metals react in the same manner as copper when current is applied. Zinc, cadmium and copper behave in such a reversible manner.

It is interesting to consider what happens when a solution contains more than one kind of metallic ion, each of which is capable of depositing on the cathode. In the simplest case, if we gradually increase the voltage, each metal will be deposited in turn as its standard potential is reached at the cathode.

Suppose we have a mixed solution of molar zinc sulfate and molar cadmium sulfate, for example. The standard potential for cadmium is -0.40 volt; for zinc it is -0.76 volt. Since cadmium is the more positive of the two metals present, its deposition potential will be reached first—at 0.40 volt. It will deposit first as the voltage is gradually increased. If the voltage is held at approximately 0.40 volt, practically pure cadmium is deposited, even though considerable zinc is present in the solution.

It is possible by this method of controlling the applied voltage to plate out most of the cadmium. As concentration of the cadmium decreases, however, it is necessary to increase the voltage or plating stops altogether.

When the voltage is raised to 0.76, the zinc begins to plate out. If we had immediately applied a high voltage to the solution of zinc and cadmium ions, both metals would have been deposited simultaneously.

Thus, as a general rule, as voltage is gradually increased, the metal with the least negative (or most positive) potential will deposit first from a solution containing two or more different metallic ions.

If we had added copper sulfate to the solution of zinc sulfate and cadmium sulfate and gradually increased voltage, the metals would have deposited in this order: copper, cadmium, then zinc. This procedure is used by the analytical chemist and by the refiner in separating metals.

Polarization

Ideally, deposition of a metal from a solution begins when the voltage reaches the standard electrode potential, as we have seen above; the deposition potential and the standard electrode potential are the same. But in practice, this is not always true. For various reasons, the applied voltage often must be higher than the theoretical standard electrode potential before deposition begins. This effect is termed *polarization*, and any time the applied voltage necessary to begin deposition differs from the standard electrode potential, the phenomenon is called polarization.

The difference in voltage between the theoretical voltage required and the actual voltage necessary is termed *overvoltage*.

There are two general types of

polarization. The first is called *concentration polarization.* It is caused by changes in concentration near the electrode surface.

Since platers are more concerned about what happens at the cathode, where metal is deposited, we will consider cathode polarization. During plating, metal ions are constantly being removed or "plated out" from the solution that surrounds the cathode. Replacement ions can be obtained by diffusion and ion migration. And we can aid the process greatly by agitating the solution, thereby keeping the concentration of the ions near the cathode as near as possible to the concentration of the ions in the remainder of the plating bath. The cathode film itself—the solution immediately surrounding the cathode—is still dependent upon diffusion for its supply of ions, however. And while we can *decrease the thickness* of this film by agitating the solution, we can never produce *entirely uniform concentrations.*

Polarization is most important in plating, for it actually determines the maximum speed with which we can deposit a metal. In plating, we know that increases in voltage and amperage increase rate of deposition —metals plate out faster. But we also find through practical experience that there is a limit to the amount of voltage and amperage we can use. Above this limit, we produce "burned" deposits. Current can be increased only until the rate of discharge of ions equals the maximum rate of diffusion of ions through the cathode film.

"Burned" deposits are actually the result of increasing the current to a point where some other ion, usually hydrogen, is discharged in addition to the metal ion.

When hydrogen begins to discharge, the potential changes and the amount of metal deposited decreases—current efficiency is lowered. Thus we deposit less metal under such conditions than would be expected according to Faraday's Laws.

Hydrogen discharge also causes an increase in the concentration of hydroxyl ions in the solution and consequent formation of basic salts, which are precipitated and included in the deposit. This is the reason that nickel solutions are operated at a low pH and are buffered—so that there are plenty of atoms ready to form hydrogen ions should the need arise.

Another type of concentration polarization occurs when plating with solutions of complex ions that must dissociate before or during plating. Here the speed of dissocia-

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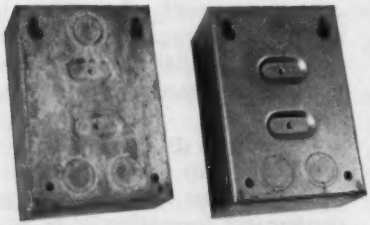

Stantite Spraying Primer was used on switch box at right only. Both boxes were sprayed with aluminum synthetic and were exposed to salt spray test for 500 hours. The results speak for themselves.

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tion limits the plating rate. Speed of dissociation is largely dependent upon concentration—lower concentrations allow faster dissociation.

Although some polarization can be expected in any plating bath operated at an appreciable rate, the overvoltage is sometimes more than can be explained by concentration polarization alone. Such overvoltages are explained by the term *chemical polarization,* which covers any situation that cannot be explained by concentration polarization. This is the case with nickel, cobalt and iron plating solutions. In each of these cases, the deposition potential is too great compared with the standard potential to be explained by concentration polarization alone (Table I).

Chemical polarization is not fully understood. But it has been noted that with a metal such as nickel we never get 100 per cent current efficiency and some hydrogen is always evolved. It has also been found that some hydrogen is included in the deposit. Thus the film of hydrogen is thought to be partially responsible for the increased potential above the deposition potential necessary for the deposition of nickel.

Actually, the causes of chemical polarization are considerably more complex, involving various processes that occur at the electrodes, such as hydration and dehydration of the ions, formation of metallic hydrides, and so on.

While the causes of chemical polarization are not fully understood, its response to various

Table I

Metal	Standard Potential (volts)	Deposition Potential (volts) 60 deg. F.	130 deg. F.
Nickel	-0.24 volt	-0.57	-0.43
Cobalt	-0.31	-0.56	-0.46
Iron	-0.46	-0.68	-0.49

changes in conditions is known. In general the following is true: overvoltage decreases as solution temperature increases; overvoltage increases as current density increases; overvoltage frequently increases with the length of time the current is applied; reducing external pressure on the solution often changes the overvoltage.

Platers are constantly concerned with changing polarization. They change it when they change voltage in the plating bath. By controlling current density, the plater is keeping polarization constant.

In some cases, the plater uses depolarizers to reduce overvoltage. Hydrogen peroxide added to a Watts nickel bath reacts with the hydrogen discharged on the cathode, thereby prevents co-deposition of

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hydrogen that would cause rough or brittle deposits.

Usually, the addition of colloidal materials or brighteners to a plating solution increases polarization and aids in producing a plated deposit that has a finer grain size.

The big problem in trying to regulate polarization is that changing any one condition affects a number of other properties of the plating bath. Changing bath temperature, for instance, usually results in the following effects:

1. Cathode polarization decreases.
2. Solution resistance decreases.
3. Current density must be increased to keep plating speed constant.
4. The rate of ion diffusion changes.

In turn, each of the above changes affects other properties of the bath. Thus it is easy to see why the plater makes every effort to hold conditions constant once satisfactory results are obtained.

★ ★ ★

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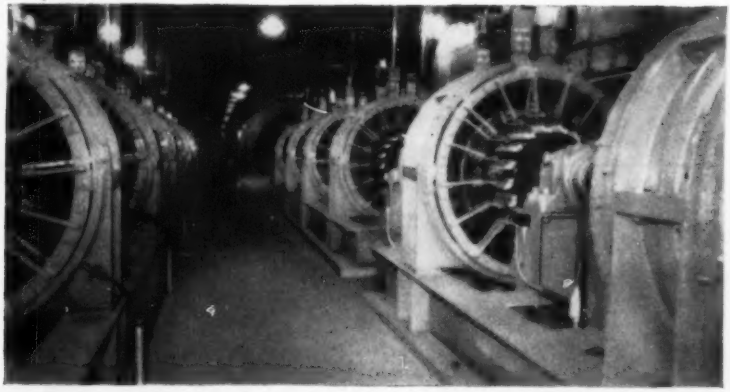

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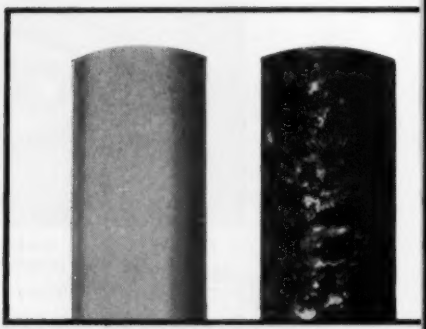
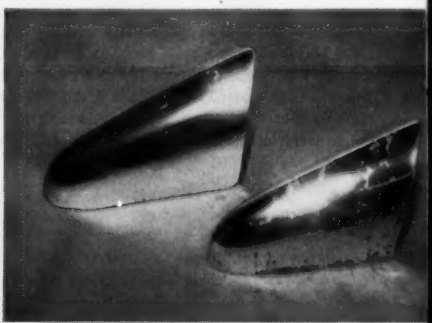
- Most major manufacturers of washing machines now specify Industrial Crack-Free Chromium on steel drive shafts. It improves corrosion resistance, reduces wear.
- With Bright Crack-Free Chromium, a leading automotive producer has substantially increased corrosion resistance of plated steel and die cast parts, especially those frequently exposed to salt air and snow-melting chemicals.



• Steel shaft on right, with 0.0005 inch of ordinary chromium, showed rust over entire surface after 100-hour salt spray test. Shaft at left, with 0.0005 inch of Crack-Free Chromium, was virtually unaffected in same test.



• After accelerated acetic acid salt spray 72 hours: Top — Bright Crack-Free Chromium, 75 millionths of inch; Bottom — Ordinary Chromium, 20 millionths of inch; both over .001" nickel and .0005" copper on steel.

cause of chromium failure

It is well known that ordinary chromium plate suffers from a network of fine cracks . . . an open invitation for corrosives to reach and corrode the basis metal. Now proved too, is the fact that Unichrome Crack-Free Chromium can overcome this shortcoming of ordinary chromium. Deposits stay sound as thickness builds up. The process delivers unimpaired all the inherent corrosion resistance of chromium metal.

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Tex-Dur is a new and unique plastic finish for metal surfaces where an attractive, decorative effect and abrasion-resistance are important requirements. Spray application produces a thick, textured film of 5 to 6 mils which looks like leather and is outstandingly durable. Its pleasing colors, moderate luster, and uniform characteristics after baking make Tex-Dur especially suitable for office equipment, vending machines, automobile inside trim, and other metal products where surfaces are subjected to hard use. Tex-Dur does not infringe on any existing patent.

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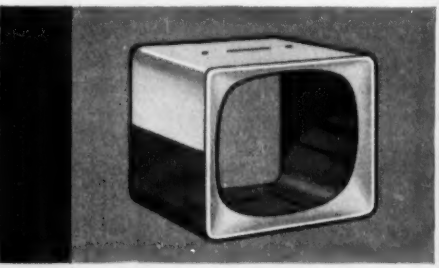

LACQUER FOR PLASTIC

pleasing change from wrinkled or hammered metal and is available in a variety of colors. Stip-Tone provides a good build on rough metals and covers uniformly in a single coat with standard spray equipment. Excellent luster, hardness, and mar-resistance of Stip-Tone make this finish ideal where eye-appeal and wear are important considerations.

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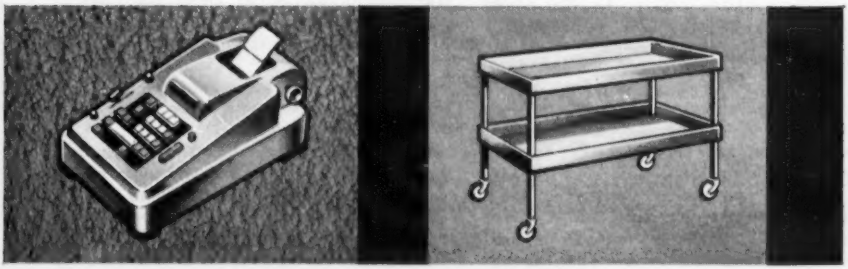

STIP-TONE **VX BAKING ENAMEL WHITE**

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A Report on the 45th Annual Convention, American Electroplaters' Society

Photos and recorded interviews from the recent national convention in Cincinnati . . .

Charles Wise, Buckeye Products Co., convention general chairman, called the 45th A.E.S. Annual Convention to order on Monday, May 19. Shown with Mr. Wise in the photograph are (first row, left to right): Dr. Russel E. Harr, Western Electric Co., chairman of the A.E.S. Scientific Achievement Award Committee; Ezra A. Blount, editor of PRODUCTS FINISHING, convention co-chairman; William Cody Kelly, vice mayor, City of Cincinnati; Louis Michelson, manager of Rocket Engines, General Electric Co., who presented the keynote address; Mr. Wise; Francis T. Eddy, Technicraft Laboratories, Inc., A.E.S. president; Mrs. Robert D. Miller, ladies' chairman; Leonard A. Chesworth, United Carr Fastener Corp., who gave the invocation; Herberth E. Head, Chrysler Corp., A.E.S. first vice president. (Second row, left to right) George W. Taylor, Production Plating Co., president, National Association of Metal Finishers; Dr. M. M. Beckwith, Harshaw Chemical Co., president, Metal Finishing Suppliers' Association, Inc.; Ralph D. Wysong, Studebaker-Packard Corp., A.E.S. second vice president; directly behind Mr. Wise is Dr. W. Andrew Wesley, International Nickel Co., Inc., A.E.S. third vice president; Dr. Samuel Heiman, Philadelphia Rust Proof Co., A.E.S. past president; Robert D. Miller, Electric Auto Lite Co., educational chairman; W. Wilson Loveless, Varland Metal Service, president, Cincinnati Branch; John P. Nichols, A.E.S. executive secretary. (Photos by PRODUCTS FINISHING.)

The PF Interview: The editor of PRODUCTS FINISHING asks prominent people at the 45th A.E.S. Convention for comments on topics of current interest in the Finishing Industry—Part I in a series of recorded interviews.

Dr. William Blum: Specifications, Control and Education Aided Industry Progress

Dr. Blum, what would you consider to be the most significant change in the plating industry?

Dr. Blum: I believe that the biggest change in the electroplating industry in the last forty years has been the increase in the use of specifications for plated products and the resultant necessary increased control of electroplating operations. This is illustrated by the advent of chromium plating, which itself required closer control. The same thing is true for the conditions needed for the nickel plating that precedes the chromium. These developments have changed electroplating from a rule of thumb process to a technically controlled process in which the products are of specified quality.

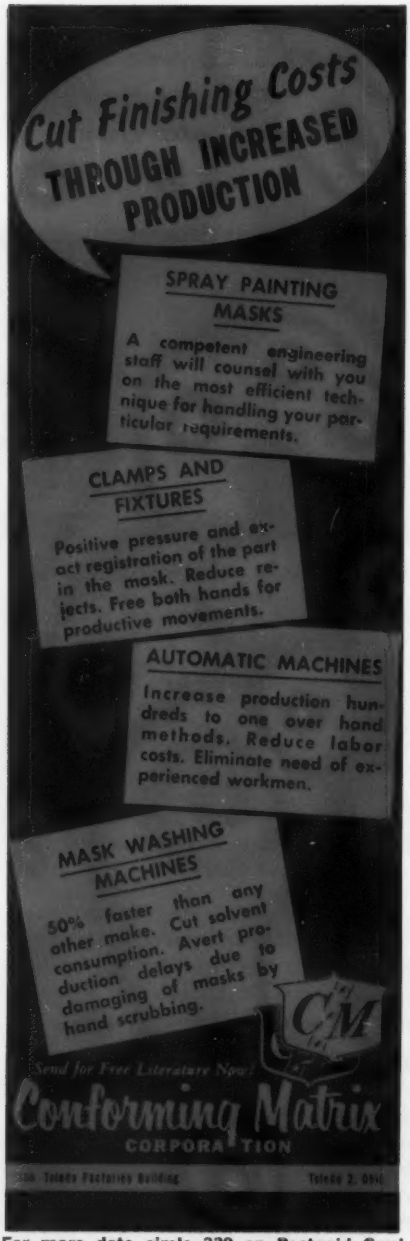
Yes, there's no doubt that this raised the status of the industry. It required that electroplaters be technically trained in order to accomplish the necessary process control.

Dr. Blum: To do this we've had to bring into the industry a greater number of professional chemists to undertake the control and research work; also, we've educated the electroplaters themselves to enable them to cooperate in and make use of the improvements made by the chemists and engineers.

Dr. William Blum (right), consultant, Washington, D. C., discusses plating industry progress with the editor of PRODUCTS FINISHING. Dr. Blum was named the winner of the First A.E.S. Scientific Achievement Award, and will deliver the William Blum Lecture at the Golden Anniversary Convention of the A.E.S. in Detroit on June 15, 1959. Dr. Blum is an honorary member of the A.E.S. and of the A.E.S. Research Committee.

You and Mr. Hogaboom have certainly made a contribution to educating the electroplater in publishing the book "Principles of Electroplating and Electroforming."

Dr. Blum: Yes, I feel sure that both of us (if he were here) would be gratified to know that the book has, as we expressed in the beginning, helped platers to know more about chemistry and chemists to know more about electroplating.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Would you comment on the significant technical developments in the industry which may have enabled the plater to do a better job?

Dr. Blum: One of the biggest changes in recent years has been the widespread use of nickel plating—bright nickel plating. This has necessitated closer control of the conditions of plating in order to secure uniformly satisfactory results.

Are there any developments in instruments or measuring devices which you feel have contributed to improved plating?

Dr. Blum: Requirements of closer control in plating have necessitated the development and increased use of instruments such as pH meters, colorimeters, and so forth, for the analytical control of the solutions. Devices for measuring physical properties such as the hardness and stress of electrodeposited coatings have also helped immensely.

What direction should future research take to be of most benefit to platers?

Dr. Blum: One of the greatest challenges to the plating industry today is the demand for plated coatings of the rare or unusual metals, and for coatings of other metals on these metals—titanium, zirconium, beryllium, and so on. It may take some years before these processes are fully developed to the point of satisfactory production. But it is safe to predict that satisfactory coating methods will be developed.

Then you feel that research should be in the direction of rare metals for severe temperature and corrosion service.

Dr. Blum: Yes. At least, there must be research in that direction. Also required is such research as is now in progress in the A.E.S. on the fundamental problems of electroplating, such as the porosity of the coating, and the factors which cause either initial or subsequent failure of the coating.

That's most interesting because it points out that fundamental, basic research must be conducted at the same time as research into newer fields.

Dr. Blum: Yes. It is safe to assume that the electroplating industry as a whole will have much the same demands made on it in future years as now, plus new demands which must be met. Therefore it is necessary to try to improve plated products to the maximum extent possible through research.

Do you feel that vacuum metalizing processes compete with electroplating?

Dr. Blum: In certain fields they may be competitive. In others they're more likely to be auxiliary in the sense that they make it possible to plate on non-metallic surfaces, which is one of the increasing demands being made on the plating industry.

Would you care to comment on the amount and quality of "pure research" being carried on in plating? Do you think it is adequate? Should there be more? Is the emphasis too much on applied research?

Dr. Blum: I think we can say safely that there is always need for more research on even a greater scale than at present. The research projects conducted by the A.E.S. need increased support in order to accomplish their objectives. The various large companies are engaged in and should continue to expand their activities in research on specific problems.

Would you care to comment on this 45th A.E.S. Convention?

Dr. Blum: It is desirable to let the country as a whole know that the purpose of conventions such as this is not simply to teach the platers new methods, but to give them an idea of the possible directions for future progress in this field.

★ ★ ★

Clyde Kelly: Our Business Is Good

Mr. Kelly, what in your opinion is the most serious problem in the job plating business?

Mr. Kelly: The most serious problem in the job plating business is the same problem that we always

Clyde Kelly (left), president of American Plating Co., Des Moines, Iowa, comments on the job plating business. Mr. Kelly is a past president of the American Electroplaters' Society, and was chairman of the A.E.S. Annual Convention held in Chicago in 1952, in conjunction with an Industrial Finishing Exposition.

have had; namely getting competent personnel and training the people that we have on the job.

What steps do you take to train your people? Do you have them take courses, or do you use "on the job" training methods?

Mr. Kelly: We use "on the job" training methods supplemented by books such as Glasstone's "Fundamentals of Electrochemistry."

Does your shop specialize in any particular type of finishing?

Mr. Kelly: We do general job shop work. Just now we are specializing in color anodizing of aluminum. We intend also to do hard coating in the future.

Do you use any special process or is your anodizing and coloring process more or less conventional?

Mr. Kelly: It's standard.

From what industries do you solicit work?

Mr. Kelly: In our area we have no large customers, and we get a very diversified kind of plating to do. We do some plating for an aircraft company and some plating for a company that makes power lawnmowers. It's very diversified.

Recently the government has allocated more money for military or defense agencies. Has your shop benefited by an increase in business as a result of government contracts?

Mr. Kelly: So far it hasn't made any difference.

Would you have any comment on the general state of the job plating business in your area?

Mr. Kelly: Just now our business is good.

We hope that you are enjoying our Convention, and would appreciate a comment about the Convention.

Mr. Kelly: The educational sessions at this convention are the best I have ever attended.

★ ★ ★

Hugh D. McLeese: Thicker Chromium Plate = Better Corrosion Resistance

Mr. McLeese, during this past winter there have been many comments about rusty automobile bumpers. This is unfavorable publicity for the plating industry. What is your opinion about the application of bright crack-free chromium as a solution to this problem?

Mr. McLeese: As a result of considerable research work done by our people, and with the cooperation of some of the automotive people, we have found that corrosion resistance can be considerably increased by the application of a bright crack-free chromium deposit. One of the large automotive manufacturers has been trying this bright crack-free chromium deposit in production for several months. The tests that have been made have indicated that there is no other way to increase corrosion resistance so easily as by this thick bright crack-free chromium.

What thickness of coating should be applied in order to be effective?

Mr. McLeese: Bright crack-free chromium is no more corrosion-resistant than the ordinary chromium in the thicknesses that have been applied in the past. To achieve

maximum corrosion resistance on such items as automotive parts, we recommend deposits of 80 to 100 millionths of an inch thick. This involves problems in production, increased tank sizes, power sources, heavier plating racks with better current carrying capacity. Hence, we do not expect people to change overnight from a ten millionths deposit to a 100 millionths of an inch chromium deposit. However, unless people are willing to put on a deposit in the range of 40 to 60 millionths of an inch, they should not expect to get an appreciably increased corrosion resistance by using bright crack-free chromium.

Do you visualize that, in addition to improving corrosion resistance of bumpers, this new plate will also be able to take the place of part of the nickel coating? Or, do you feel that it should be used to improve the quality of the present nickel plate?

Mr. McLeese: We are not advocating the use of thinner nickel deposits because plating has acquired a bad reputation as a result of using too thin nickel deposits in years when nickel was in short supply. We are recommending that normal nickel deposits be used, and in addition, that the thick bright crack-free chromium deposit be applied.

How can manufacturers and job platers take advantage of the properties and characteristics of bright crack-free chromium?

Mr. McLeese: In order to be able to obtain the advantages of this chromium plate they must provide facilities that permit plating time cycles three to five times longer.

Hugh D. McLeese (left) points out that thicker, crack-free chromium deposits can improve the corrosion resistance of automobile bumpers. Bumper sections plated with the crack-free chromium can be seen in the photo. Mr. McLeese is vice president of Metal & Thermit Corporation, Rahway, New Jersey.

They need to provide greater current sources so as to use the maximum recommended current densities for depositing the crack-free chromium. They also need to be sure they are providing plating racks with the current-carrying capacity required at the current densities recommended.

This would indicate that the application of this process would result in the design and sale of additional plating equipment.

Mr. McLeese: That's undoubtedly true, and it is our feeling that, while it will result in the sale of additional equipment, from the finisher's viewpoint the equipment required will be fully justified by the increased corrosion resistance obtained.

What are the desirable temperatures which must be maintained in the bath, the current densities, and the times and other details of the process?

Mr. McLeese: The current density normally used is somewhat higher but not too different from what is widely used at the present time in ordinary chromium plating. Temperatures are in the range of 120 to 130 deg. F. While there is quite a wide current density range, the maximum permissible current density should be used in order to keep the plating time and the number of tanks required to a minimum.

How do the throwing power and plating characteristics of this solution differ from other solutions?

Mr. McLeese: The bright crack-free chromium solutions have remarkably good covering power and, in fact, have been used in one or two cases for that property alone.

Chromium plating solutions have rather poor throwing power generally. Would you say that this solution is twice as good as we used to consider normal, or three times as good?

Mr. McLeese: I don't believe it's possible to answer that question in that way, but we can say that on some parts that are difficult to plate —such as large automobile parts with recessed areas—excellent results have been obtained.

★ ★ ★

Howard J. McAleer: The 1959 Industrial Finishing Exposition Will Be The Best Ever

Mr. McAleer, what percentage of the space has been sold for the 1959 Industrial Finishing Exposition?

Mr. McAleer: In the few days we've been here we have sold some 55 per cent of the total dollar space sold at the Chicago Show. We have sold 65 per cent in dollars as much space as we sold for the entire show held in Cleveland in 1955. That certainly represents enthusiastic response from our prospective exhibitors.

Is there a general theme that you plan to follow in setting up the various displays?

Mr. McAleer: Yes, the fact that the A.E.S. is celebrating its 50th anniversary gives us a theme which we intend to emphasize. We plan to stress the progress plating has made in the last 50 years.

Do you have plans that you regard as new and different?

Mr. McAleer: Yes. In fact, those plans account for the success we have had in selling space. We are making an entirely new approach in selling space from an exhibitor's standpoint. Our aisles are wide and roomy — 14 feet is not at all unusual for main traffic aisles—some are as wide as 20 feet. We are trying to build a show which we call an "open type" show. It will be very modernistic. There will be no blocking signs of any type. The show is well spaced by individual aisles so that each exhibitor will have a chance to show off his materials to better advantage.

Of course, attendance is necessary to the success of any exposition. To ensure attendance educational sessions will be held in the afternoon in the exposition hall. The exposition will be open two evenings. There is a possibility that we may have a private showing, by invitation only, on Monday night. At-

Howard J. McAleer (right) discusses the forthcoming Industrial Finishing Exposition to be held in Detroit, June 15-19, 1959. Mr. McAleer is president of Formax Manufacturing Corp., Detroit, Mich., and is chairman of the Industrial Finishing Exposition. A floor plan of the Exposition Hall can be seen in the background behind Mr. McAleer.

tendance is further guaranteed by the fact that our annual outing, the Detroit A.E.S. Outing, will be held at the exposition site.

For those who are not familiar with the Detroit Exposition Hall, would you explain where the educational sessions are to be held with reference to the display area?

Mr. McAleer: The exposition site is a large building, containing some 200,000 square feet of floor space. It has a second floor that is quite large and, fortunately, is virtually soundproof. The educational sessions will be held on the second floor, above the exposition.

In view of your experience in selling space for the exposition, do you feel confident of an early upturn or improvement in business, both in the Detroit area and in the entire finishing industry?

Mr. McAleer: Yes I do. I have confidence based on the fact that our local manufacturers—the manufacturers supplying the automobile industry—have increased their space substantially as compared with previous expositions. Many of them have been through the "hard sell" program and feel they have new equipment and new ideas to offer this industry.

Our space will probably be all gone within the next few weeks. We can guarantee the man who visits the Exposition the finest one that he has ever seen.

★ ★ ★

William W. Chace: Choose Lacquer Finishes With Care

Mr. Chace, you've had many years' experience in making lacquers for protecting plated products. What are some of the qualities the finisher should watch for when choosing and using a lacquer to protect his highly polished products?

Mr. Chace: Plated or polished surfaces deserve good protection. The means of this protection should be chosen with care. Various metals demand a particular type of lacquer, and its kindred reducer. I repeat, kindred reducer. Adding foreign solvents to a high grade lacquer is like adding oil to water. The consistency can be gauged with instruments, such as a light liquid hydrometer or viscosity cups. If no instruments are on hand, one may accomplish fair results by noting the appearance of the film after it is dry. If iridescent colors appear, the mixture is too thin; if the surface is uneven—

William W. Chace (right) uses lacquered articles to illustrate his comments on lacquer films. Mr. Chace is president of Agate Lacquer Manufacturing Company, Inc., Long Island City, New York.

orange peel effect—the mixture is too heavy.

What are now called baking lacquers are actually varnishes. However, the film produced with these coatings is tougher and more durable than the film produced with concentrated air-dry materials.

Now a word about cost. This is not determined by price per gallon. When you buy coatings, always consider mileage as well as finish quality.

★ ★ ★

Roy Isaacs: Australia's Plating Industry Is Growing Rapidly

What types of plating do you do in your job plating plant in Sydney, Australia?

Mr. Isaacs: We do general jobbing. We concentrate mainly on hard chrome plating and the anodizing of structural work, mouldings, and window frames. We also do decorative work, bumper bars, and general plating for protection.

What about plating methods in your plant?

Mr. Isaacs: We do a wide range of plating. We don't go in for the big barrel size as we prefer to use small barrels.

Do you do cadmium and zinc work?

Mr. Isaacs: Only cadmium.

Do you have an automatic plating machine?

Mr. Isaacs: No, but there is quite a lot of automatic plating work done.

What size shop do you have?

Mr. Isaacs: We have about 40 employees. We are the largest job plating shop in Australia.

What is the size of the plating industry in Sydney, or in all of Australia?

Mr. Isaacs: I can say of Australia that we are a very fast growing plating country. I would estimate that there are between 250 and 300 plants that have plating installations in Sydney alone.

Does that include what we call captive plants or is that just job shops?

Mr. Isaacs: General manufacturers doing their own electroplating and job shops.

What industries do you work for?

Mr. Isaacs: We mostly do jobbing for the engineering work shops. By this I mean the manufacturers and reconditioners. We concentrate largely on grinding and hard chrome plating of aircraft engine parts. The railroad industry is becoming more

important, but at present we do more work for the truck transport and racing car industry.

You mentioned that you anodize aluminum window frames for window manufacturers. Would you elaborate on that?

Mr. Isaacs: We mainly do work for contractors who build window frames. Aluminum is becoming very important in Sydney. We're building a special plant, which will be near completion by the time of my return, just for anodizing of aluminum extruded sections.

Does that mean that you will have extra long tanks?

Mr. Isaacs: Yes, we're using tanks up to 22 feet long.

Here in the United States, we buy a special silicon-aluminum alloy which, after anodizing, has a gray finish.

Mr. Isaacs: We have extrusions made from that alloy in Sydney. We get many demands for color work and colored extrusions. I'm traveling to Switzerland to study this process. The entire trip will take me around the world to England, France, Germany, Switzerland and then back home.

The purpose of the whole trip is to learn as much as I can about anodizing in color. There are a few anodizing plants which I would like to visit over here. As yet, color has not been used in building construction in Sydney.

Could you tell me more about this process which you are going to investigate in Switzerland?

Mr. Isaacs: The main thing I am going to do over there is study organic and inorganic dyes. I think we refer to that as pigment precipitation. We have carried out quite a few experiments, but haven't had much chance to go through large anodizing plants.

Are you interested in some particular papers here at the Convention?

Mr. Isaacs: Anything I can find out on the subject of anodizing and hard chromium plating will be useful to me.

What is your comment on Mr. Cohen's paper "Effect of Shot-Peening Prior to Chromium Plating on the Fatigue Strength of High-Strength Steel?"

Mr. Isaacs: This is very important to us. The possibility of shot peening rather than heat treating before and after plating is of interest.

As a matter of fact, from what I have seen and heard here, I believe that the installation of shot peening equipment is an absolute "must" for us.

Roy Isaacs (right) discusses his plating business and comments on the Australian plating industry. Mr. Isaacs is vice president of Chrome Hardening Pty. Ltd., St. Peters, Australia, and alternate delegate from the Sydney (Australia) Branch of the A.E.S.

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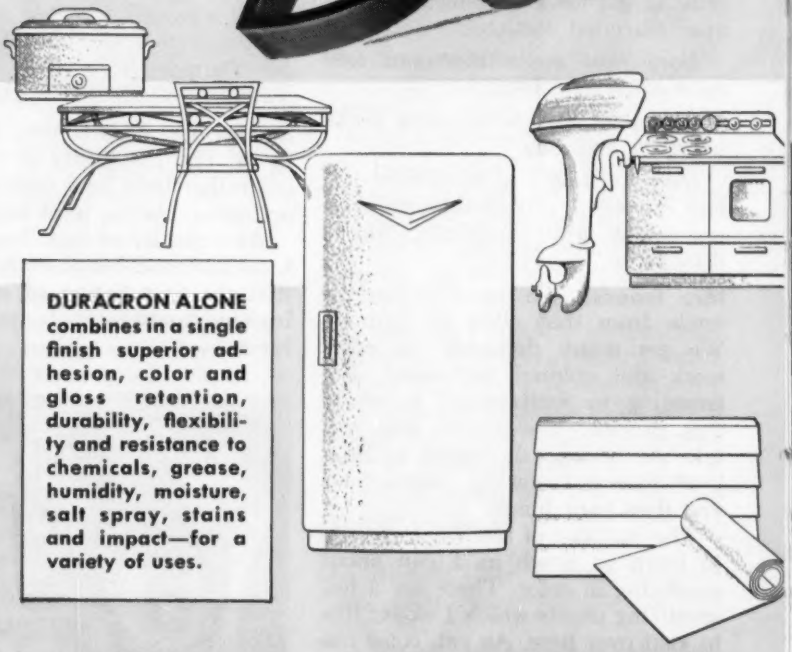

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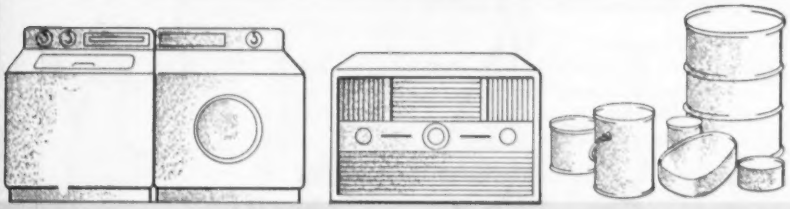

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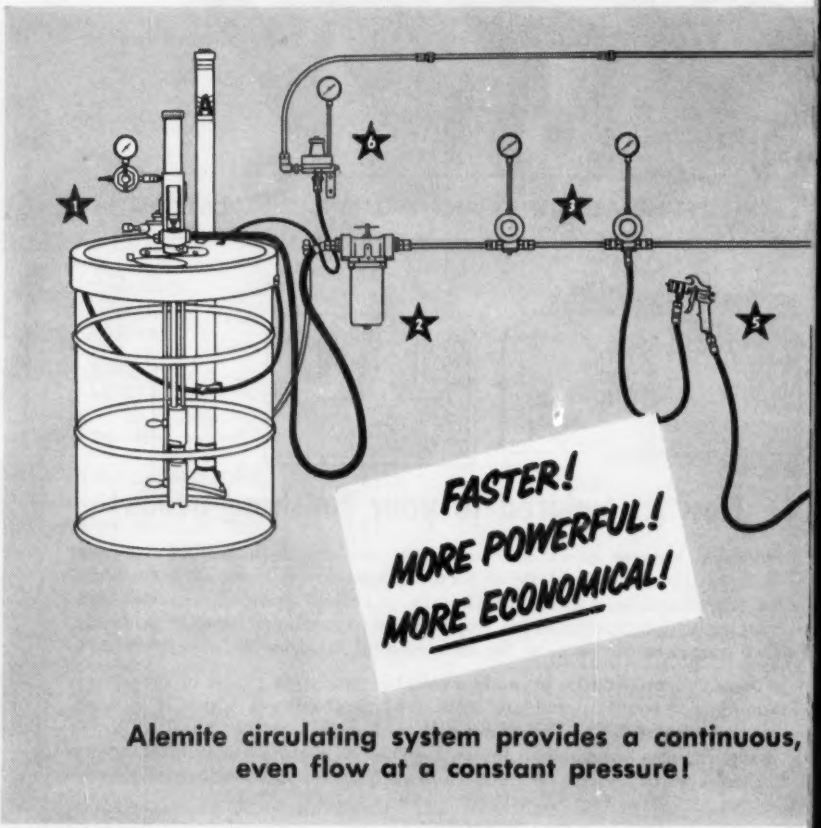

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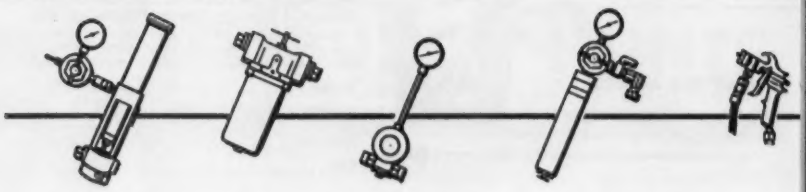

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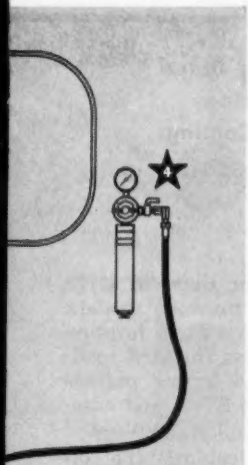

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4. Air transformer removes oil, water and other foreign objects from air line. Insures clean, regulated air for paint atomization.

5. Spray gun handles a complete range of materials, from light lacquers to heavy synthetics, with ease. Compact . . . high-capacity. Available with either dual-control valve for individual control of both atomizing air and fan pattern, or with single-control valve for high-speed, long-run production.

6. End-of-the-line pressure regulator automatically maintains pressure in the main line . . . eliminates pressure surge in the system. Assures fully controlled, high-volume pressure.

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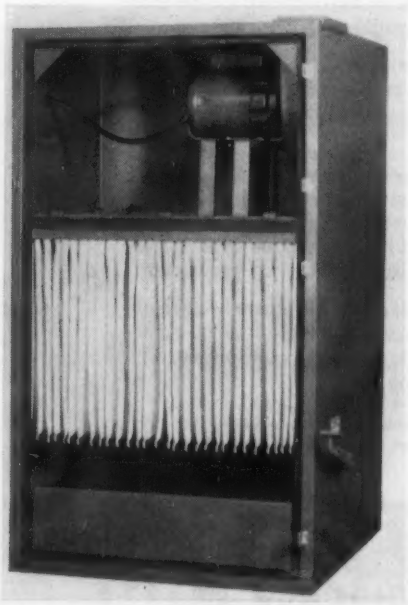
Page 84

New Equipment, Materials, Processes

Polishing, Buffing, Degreasing, Cleaning, Barrel Finishing, Plating, Anodizing, Phosphatizing, Baking, Vacuum Metalizing, Chromate Coatings, Paint Finishing, Waste Treatment

Dust Collector

Description: Redesigned Torit Model 75-80 Dust Collector has a larger filter area (150 square feet) and a dust-storage space almost four times as large (two cubic feet) as previous models. These modifications result in improved filter efficiency; less frequent loading of the filter; and longer periods before shake-down of filters and emptying the dust drawer are required.



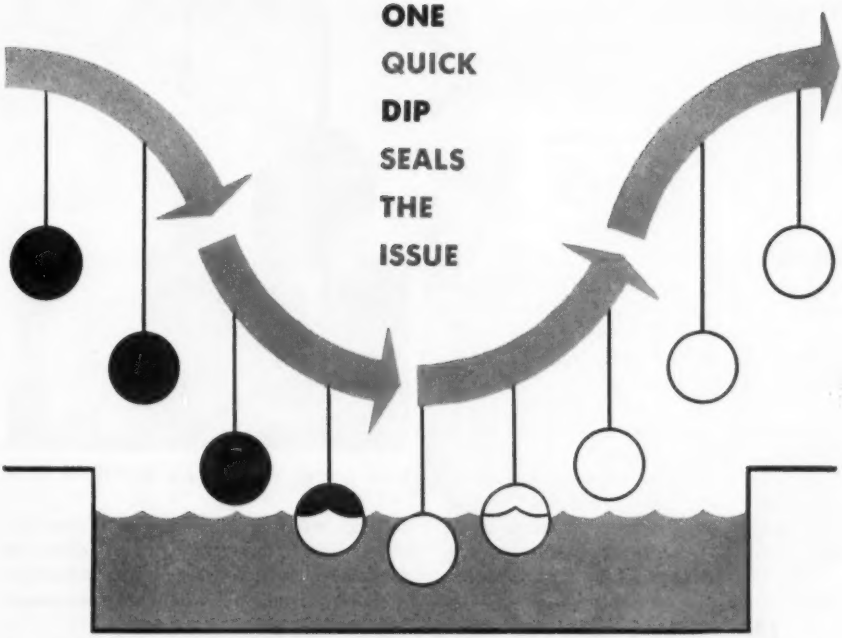
Torit Model 75-80 Dust Collector: increased filter area, more dust-storage space

The self-contained cabinet-type collectors will handle up to 600 c.f.m. of air to be cleaned. The filters are fine-woven cotton, treated to resist sparks.

In operation, Torit's dust collectors draw dust-laden air into the cabinet from hoods at dust sources. Heavy particles fall immediately into the dust tray, while the finer dust particles are trapped on the outer, under sides of the filters.

Most of these particles fall into the tray when the machine is stopped. The rest can be shaken loose by a handle on the outside of the cabinet. The cleaned air can be recirculated into the room, thus conserving heat, or exhausted outside, if preferred.

Model 75-80, which is equipped with a one-h.p. motor, will move 600 c.f.m. of air through a single four-inch inlet at four inches static pressure; 400 c.f.m. through a single three-inch inlet at five inches, or 350 c.f.m.



CORDOBOND® R-203 • Sealing and Finishing Compound

Fast sealing and finishing in one operation for porous metal castings. Corrosion resistant, impervious to action of water, sulfur, acids, alkali and other contaminating factors.

Seals minor porosity and furnishes a pleasing appearance to the part. Dip, spray, brush or flow coating techniques are commonly used.

Standard colors are black and brown — other colors available upon request.

DIP PROCESS TECHNICAL DATA

Cleaning: Standard etching, neutralizing and drying.

Dip: Viscosity controlled with thinner. Pre-try Temp. ° - 120°F - 130°F. Curing Temp. ° - 180°F - 190°F.

Finish: Semi Gloss. Tough, chip and peel proof. Leak proof.

Wt/gal: 7#.

Please send to

Name .....

Company .....

Address .....

Dept. ..... ☐

1. Additional info on Cordobond R-203
2. 1 pt. sample Cordobond R-203 for $1 C.O.D. to cover handling costs ☐

CORDO CHEMICAL CORPORATION • 34 Smith St. • Norwalk, Conn.

For more data circle 343 on Postpaid Card

through each of two three-inch inlets at four inches static pressure.

Manufacturer: Torit Mfg. Co., 296 Walnut St., St. Paul 1, Minn.

For more data circle 1 on Reader Service Card

★ ★ ★

Drum Carrier

A patented device to hold drums while they are being transported on a monorail or crane or for hoisting with a chain block has been introduced by Morse Manufacturing Co., Inc., 762 W. Manlius St., East Syracuse, N. Y.

One man can attach this holder to the drum without tools.

Tilt locks hold the drum in a vertical position during travel or hoisting. One man can tilt the drum to pour the contents into another container.

The Drum Karrier, as this device is called, will fit all standard double-chine steel drums. Further data is available from Morse Manufacturing

Drum Karrier: one man can control the drum

IMPROVE FLOW-COATING WITH BENDIX ULTRA-VISCOSON

Keep paint at the right viscosity for flow-coating appliances, automotive parts or countless other products with Bendix Ultra-Viscoson*. This electronic viscometer automatically controls the addition of solvent to the supply tank as well as indicates and records continuous viscosity readings. Operates on any type of flow-coating equipment. *REG. U.S. PAT. OFF.

- Eliminates "ORANGE PEEL" appearance due to high paint viscosity.
- Eliminates STREAKS due to low paint viscosity.
- Minimizes REWORK, resulting in COST REDUCTION.
- Improves UNIFORMITY and QUALITY.
- Proportions of PAINT and SOLVENT held to close tolerance.

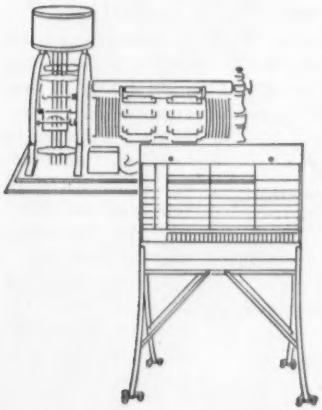
Cincinnati Division, Dept. 390, 3130 Wasson Road, Cincinnati 8, Ohio.
Export Sales: Bendix International Div., 205 E. 42nd St., New York 17, N.Y.
Canada: Computing Devices of Canada, Ltd., Box 508, Ottawa 4, Ontario.

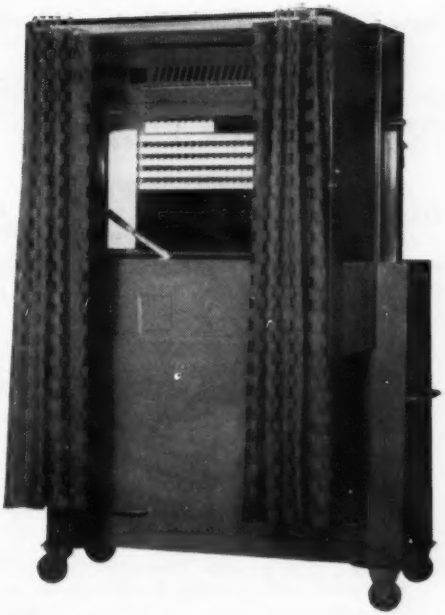
Cincinnati Division

Bendix AVIATION CORPORATION

For more data circle 344 on Postpaid Card

The automatic voting machine—first patented by Thomas Edison—is now used by almost half the national electorate. Most of today's machines, such as the one at right, are made by Automatic Voting Machine Co., Jamestown, N.Y. Self-storing and built to last for years, they are protected against corrosion by a 5-stage finishing process employing ACP GRANODINE.





ACP GRANODINE ASSURES FIRMLY BONDED, CORROSION-RESISTANT FINISH ON VOTING MACHINES

There is a good chance that last time you voted, you cast your ballot on a machine like the one above made by Automatic Voting Machine Company, Jamestown, N.Y. Because these machines are necessarily in storage most of the time—often in unheated warehouses or basements of municipal buildings—it is essential that the metal be protected against corrosion. Automatic Voting Machine Company uses ACP GRANODINE for this reason. It chemically converts steel surfaces to a non-metallic phosphate coating. This not only increases adhesion of the finish, but also greatly improves the corrosion resistance of the finishing system, even when used in conjunction with a relatively thin and flexible paint film. ACP GRANODINE zinc phosphate coatings are economically applied by dipping, spraying or brushing. Why not investigate the advantages of ACP GRANODINE for your own finishing operation.

GRANODINE is a registered trademark of American Chemical Paint Company

Write for Bulletin 1380. Describes the various types of ACP GRANODINE; gives the information you need to select the proper type for your particular application.

AMERICAN CHEMICAL PAINT COMPANY

Ambler 14, Pa.

Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont.

CHEMICALS ACP PROCESSES

New Chemical Horizons for Industry and Agriculture

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Co., Inc., 727 W. Manlius St., Syracuse, N. Y.
For more data circle **2** on Reader Service Card

★ ★ ★

Disposable Clothing

Description: Industrial clothing that can be worn and then discarded is useful in plants and laboratories. The disposable clothing is available as lab coats, jackets, aprons, shirts, pants.

Manufacturer: Textile Products, 181-189 Chestnut St., P. O. Box 638, Newark 1, N. J.
For more data circle **3** on Reader Service Card

★ ★ ★

Platinum Plating Bath

Description: A platinum plating bath that is reported to produce a pore-free plate of any practical thickness in one continuous operation is expected to be useful in plating parts for high temperature service and for other applications.

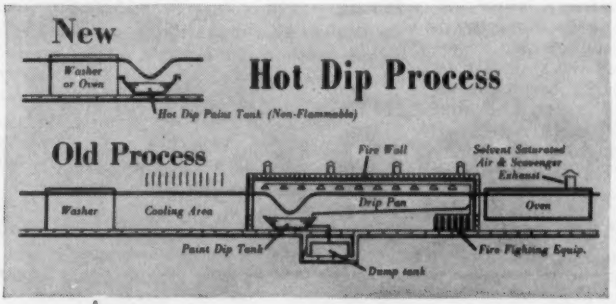
Called Platinex III/LS, this recently developed material is said to produce an economical platinum plate that duplicates exactly the surface of the basis metal, offers high-temperature corrosion resistance (withstands 2000 deg. F. indefinitely), has low stress and high ductility. Electroformed sheets can be formed or crimped without cracking, the manufacturer states.

Bath requires addition of a replenisher and water for maintenance, operates at 167-185 deg. F., produces no fumes.

NEW
PAINT SAVER

Revolutionary Hot Dip Process.
David-Ludwig Company solves your PAINT FINISHING problems.

This hot dip process has greatly simplified paint dip operations with resultant savings in *paint usage, floor space* and *initial cost.* The process consists of preheating the article and dipping it into a paint operating at 160° F. Leaving the tank the solvent is instantly evaporated from the paint by the heat radiating from the article. This provides *quick drying, uniform thickness* and *drip-free coat.* Since the solvent used is trichlorethylene the system is *fireproof,* providing *safety* for plants and employees. Contact A. D. Ludwig, Vice President, for additional information.



David Ludwig co.

Manufacturers and Installers of:
Finishing Systems
Ventilating Systems
Dust Collecting Systems

14290 Goddard Avenue, Detroit 12, Michigan
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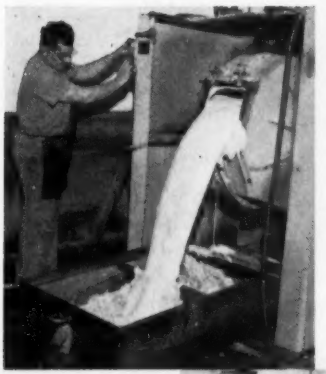
The "run-in" media *instantly* ready for top efficiency

SIMONDS ABRASIVE CO.

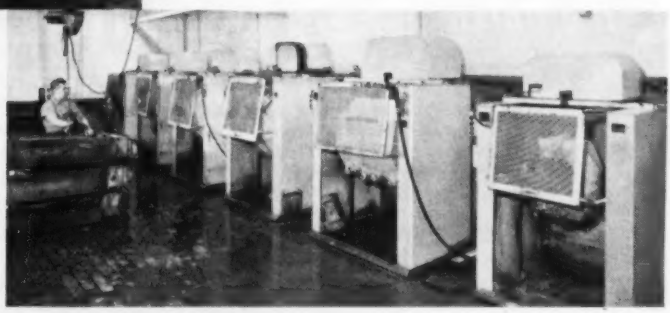
Borolon®

TRADE MARK

TUMBLING CHIPS



Fused crystalline aluminum oxide abrasive chips with each particle dense and solid with multiple abrasive surfaces. *Pre-tumbled* for immediate "run-in." Hard and tough. No sharp edges or flat spots. New standards of sizing provide wider range, more accuracy and help avoid wedging in recesses of parts being tumbled. Write for bulletin ESA 236.



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Applications: High-temperature connectors and circuitry for rockets and missiles, parts for silicon and germanium transistors.

Manufacturer: Sel-Rex Corporation, Nutley 10, N. J.

For more data circle 4 on Reader Service Card

Skyscraper Parts Washer

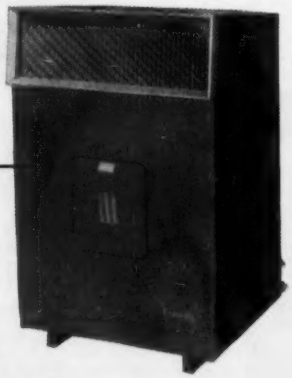
Description: A washing machine that cleans parts while they are being carried upward on chain-driven vertical flights saves valuable floor space. This recent Ransohoff entry into the washing machine field occupies only 16 square feet of plant area.

Operation: Parts are placed on a separate loading conveyor, which carries them to a charging hopper. This hopper feeds the parts through an opening in the machine housing into a series of perforated flights. Flights are carried by a double-chain conveyor, which is designed to prevent spillage. During upward travel of the flights the work in them is sprayed with cleaning solution. This solution is pumped up from a tank at the base of the machine by a centrifugal pump. Used solution returns to the tank for recirculation.

At the upper end of the conveyor travel, the flights are inverted to dump the parts into an unloading chute, which can be used to carry the parts to the next stage of the manufacturing process.

ONLY SICON "takes" the 550°F. temperature reached in sections of this Preway heater grille.

ONLY SICON protects this "Direction Flo-Grille" where temperatures often reach above 500°F.



EVEN A HOT 550°F. can't faze the finish when it's

Sicon®

SILICONE HEAT RESISTANT FINISH

The upper grille of the famous PREWAY heater often reaches a surface temperature of 550°F. Here, the use of an organic finish was found to require raising grille to protect lower part. But in tests SICON protected so well that re-design proved unnecessary. SICON in smart decorative colors can protect your product too—and save money besides! Write for proof.

Write for copy of SICON Brochure.

MIDLAND Industrial Finishes Co

DEPT. F-6, WAUKEGAN, ILLINOIS

ENAMELS SYNTHETICS LACQUERS VARNISHES

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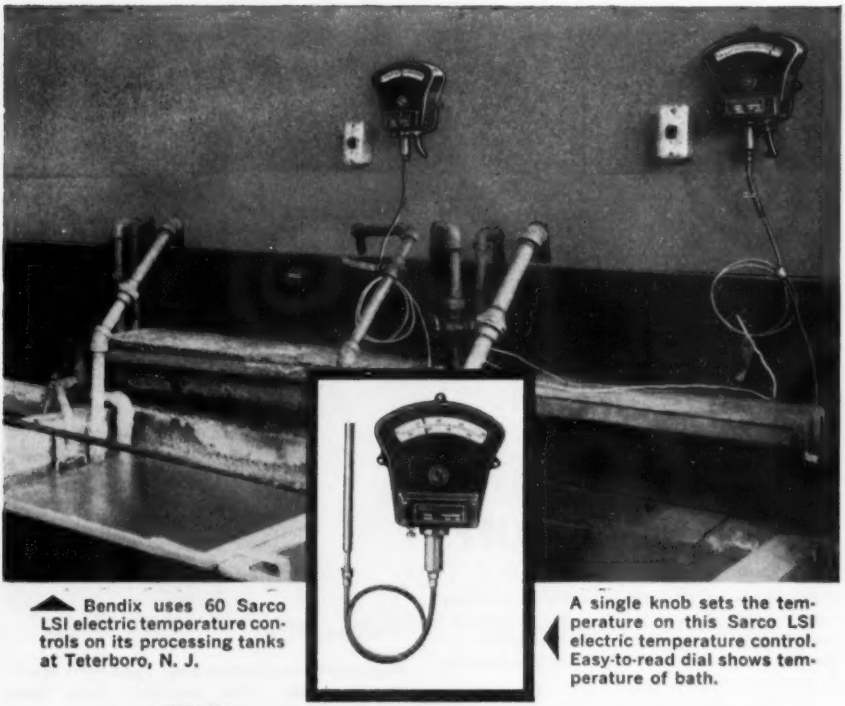

Bendix uses 60 Sarco LSI electric temperature controls on its processing tanks at Teterboro, N. J.

A single knob sets the temperature on this Sarco LSI electric temperature control. Easy-to-read dial shows temperature of bath.

How Bendix controls temperatures in 60 processing tanks with Sarco Electric Indicating Regulators

In the completely modernized plating department of Eclipse-Pioneer Division of Bendix Aviation Corporation at Teterboro, N. J., temperature in all processing tanks is controlled with Sarco LSI Regulators. This standardization has paid off in accuracy, dependability, and economy. Among the varied processes for which LSI's are now used are Black Dye, Dichromate Seal, Parker Lubrite, Hot Water Rinse, Electro Cleaner, Passivate, Black Oxide Copper and Chromium Plating.

You can get a complete Sarco system for as little as $130 a tank

This Sarco LSI makes it unnecessary to rely on erratic manual temperature control. Further, the low initial cost of the LSI and its almost negligible maintenance cost mean completely dependable temperature control with real economy. Call your nearest Sarco representative, or write for details on Sarco LSI temperature controls and your copy of Sarco Case History No. 174.

5927-A

SARCO
COMPANY, INC.

635 Madison Ave., New York 22, N. Y.

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TO REDUCE your UNIT COST SPECIFY and INSIST on the Original Finger-Buff* the CHURCHILL FINGER-BUFF*

For faster cut and superior finish at lowest unit cost, specify and insist on the original . . . the Churchill Finger-Buff* with its flexible finger buff action that is particularly adaptable to contours.

Let Churchill experience reduce your unit cost. Let the Churchill Finger-Buff*, the original Finger-Buff*, prove its effectiveness to you . . . prove its greater flexibility and faster cutting action!

Write your problem . . .

Solving every-day and specialized buffing problems has been Churchill's **only** business for 21 years. Originator of the Finger-Buff*, Churchill has developed and carries in stock a Churchill Finger-Buff* for nearly every buffing, polishing and coloring operation.

Churchill Finger-Buffs* are made from sisal or cloth; always bias-cut and top grade material; in all sizes from 3" to 21" diameters.

*Churchill Finger-Buff, T.M. Reg. U.S. Pat. Off.

REPRESENTATIVES IN PRINCIPAL CITIES

Geo. R. Churchill Co., Inc.

Dept. PF-68, Hingham, Mass.

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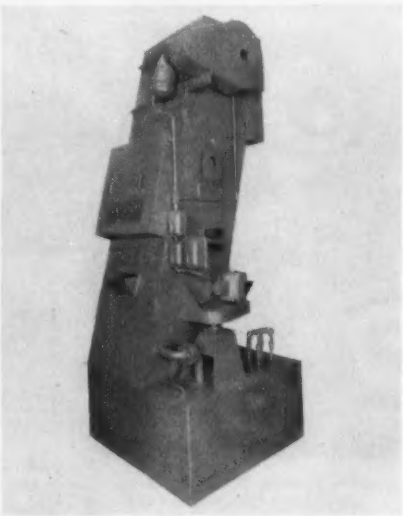
The housing of this machine can be extended upward to permit discharge of parts on the floor above. The conveyor can be designed to carry large



Ransohoff Vertical-Conveyor-Type Parts Washing Machine: saves valuable floor space

or small parts. Fog rinsing and drying stages can be added to the cleaning stage. The solution tank may be heated by gas or electricity.

Manufacturer: Ransohoff, Inc., 610 North Fifth St., Hamilton, Ohio.

For more data circle **5** on Reader Service Card

★ ★ ★

Pedestal-Type Pumps

Description: Pedestal-type corrosion-resistant centrifugal pumps will pump from 10 to 80 g.p.m. against heads of 70 feet, with the motor running at 3,450 r.p.m. Solids from 3/16 inch in diameter up to 5/16 inch can be passed through the pumping chamber. Ports are 1 by ¾ and 1 by ½ by 1¼ inches.

These recently introduced pumps

Scrivener's Parking Building, Baltimore. Aluminum paneling is treated with beautiful Bonderite Architectural Green.

sheathed in aluminum . . . and protected by

Bonderite Architectural Green

You'll see many more buildings, like this attractive structure in Baltimore, using aluminum finished with Bonderite Architectural Green. There are so many things to recommend this beautiful, durable Bonderite coating!

Treatment with Bonderite Architectural Green protects aluminum from corrosion. The same protective treatment chemically produces a soft, lasting green color which is a part of the integral coating of the metal surface. Color is sun-and-weather-fast.

Bonderite Architectural Green costs far less than electrolytically produced color coatings for aluminum. It is simple to use, and the color uniformity is a sure visual check on the uniform quality of the coating, maintained in volume production day in and day out.

Bonderite Architectural Green may be applied by spray or immersion, and by continuous strip treatment.

Metal treated in this manner can be used not only in construction panels, but also for siding, awnings, venetian blinds and many items on which the excellent color and durability contribute to a better, more salable product.

Write for descriptive illustrated booklet "Bonderite 700 Series". Details on Bonderite Architectural Green, uses, advantages, characteristics.

Since 1914—leader in the field

PARKER RUST PROOF COMPANY
2172 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base	BONDERITE and BONDERLUBE aids in cold forming of metals	PARCO COMPOUND rust resistant	PARCO LUBRITE wear resistant for friction surfaces	TROPICAL heavy duty maintenance paints since 1933

*Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

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have oversized ball bearings to allow carrying heavy loads without danger of damage: a locked bearing prevents the impeller from riding forward and scoring the pump housing.

The "Flex Seal" used on these pumps is self adjusting for wear, requires no run-in period.

Manufacturer: Bart Manufacturing Co., Belleville, N. J.

For more data circle **6** on Reader Service Card

★ ★ ★

Fixture-Type Deburring Machine

Description: The Roto-Matic, a deburring machine equipped with four to 16 fixtures is useful in surface-finish improvement and deburring of parts ranging from compressor components to jet engine blades.

The recently introduced machine will deburr inside diameters, produce micro-inch finishes of the order of three to four R.M.S., eliminate stress risers.

The machine employs fine abrasive media — eight to 14 mesh — thus produces a high polish while deburring at the same time.

A single operator can control the machine by pushing buttons on a control panel. The fixture - actuating mechanism is air-operated and is automatic or linked to a foot pedal at the operator's station. This works in conjunction with a cam-operated automatic spindle-raising and lowering device also located at the operator's station.

HOLLOW CONE
in complete choice of spray patterns and capacities
FLAT SPRAY
CONTROLLED-FLOW*
SPRAY NOZZLES
*exact control of pattern, impact, volume and distribution for any liquid at any pressure.
FULL CONE
for better washing coating and rinsing
for complete information write for catalog NO. 24
SPRAYING SYSTEMS CO.
3229 RANDOLPH STREET • BELLWOOD, ILLINOIS

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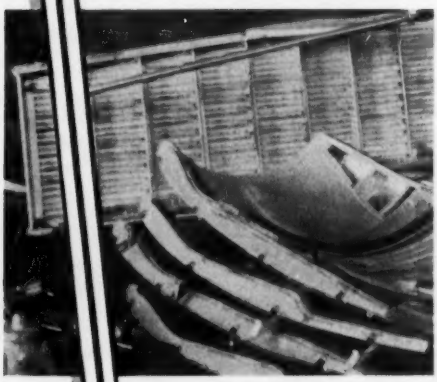
Special Purpose
HIGH TEMPERATURE
Masking Tape



Here's a pressure-sensitive paper tape especially developed for high temperature paint masking of anodized, allodized and chemically treated metal surfaces.

Shuford's SHURTAPE CP-42 with its rubber impregnated, crepe paper backing holds up under extremely high temperatures of even 350° F and long bake cycles of two hours.

Strips clean, leaves no deposit. Resists abrasion, water, oil and solvents. Releases easily from the roll.

Shuford's
SHURTAPE®
CP-42

For complete details, write

CLOTHES LINES • TWINES
PRESSURE-SENSITIVE PAPER TAPES
SASH CORDS • WEATHER STRIPPING
COTTON & RAYON YARNS • EXTRUDED PLASTICS

Shuford SINCE 1880 Mills, INC
HICKORY, N. C.

3265

World's Largest Manufacturer of Cotton Cordage

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REPLACE THAT
HOT BLACKENING BATH
WITH
DEEP PENETRATING

DICROPAN © PAT.

The Only ROOM TEMPERATURE Bath
That works in as little as
13 SECONDS

NON-CAUSTIC—NO FUMES—NO HEAT
For the first time in history you can eliminate messy, expensive, dangerously hot caustic blackening baths. DICROPAN makes your blackening operation a pleasure for your men instead of health and equipment hazard. On Polished Steels, DICROPAN gives a finish that looks like black chrome with blue overtones.* Also gives complete coverage on forgings, stampings, castings and machined parts. **RUST AND ABRASION RESISTANT.** Write for Dicropan Literature or circle No. 409 on Postpaid Card.

DICROPAN-T4 © PAT.
The perfect TOUCH-UP for correcting Damaged or Off Color surfaces following all blackening operations . . . Ideal for: **STEEL MARKING AND LAY-OUT.**
Not affected by heat of cutting, Alcohol, Cleaning Agents or Outdoor Storage. No dimensional change. Can be sprayed, brushed or swabbed on. Thickeners available for vertical application or stencilling. Deep penetration—No after-rust—Highly Abrasion Resistant —Simple to apply PERMANENT—Write for Dicropan T-4 Literature or Circle No. 410 on Postpaid Card.

DICROPAN-A © PAT.
Room Temperature Immersion For Blackening
ALUMINUM
Eliminates Costly Out of Plant Anodizing
Tough—Durable—Abrasion Resistant. Can be readily touched-up when surface is marred or damaged during fabrication after blackening. Color-Fast. **WILL NOT FADE UNDER LIGHT.** Withstands High Temperatures and Unlimited Outdoor Exposures. Write for Dicropan-A Literature or Circle No. 411 on Postpaid Card.

DICROPAN-B © PAT.
Room Temperature Immersion For Coloring All
COPPER AND COPPER ALLOYS
Chemical Spectrum Colors—End Point Coloring—Permanent, deep colors that require no unusual techniques to handle. Turns out volume work in minutes where it used to take days. (Used on recent federal constructions in Washington, D.C.). For structural work, appliances, hardware, accessories, luxury and every-day hard goods. Equally effective on Solid or Plated materials. Write for Dicropan-B Literature or Circle No. 412 on Postpaid Card.

Bob Brownell's
CORNER MAIN & THIRD
MONTEZUMA – IOWA
Phone Main 3-5401
For more data circle 354 on Postpaid Card

Production rate depends upon the number of parts that can be processed on a single fixture, the number of fixtures (standard machines have from four to 16) and the degree of surface refinement desired.

This eight-spindle Roto-Matic deburring machine operates with a four-minute cycle, with one part fixtured to each spindle, produces 120 finished pieces per hour. One operator handles all controls from central panel.

Manufacturer: Roto-Finish Co., 3704 Milham Rd., Kalamazoo, Mich.
For more data circle **7** on Reader Service Card

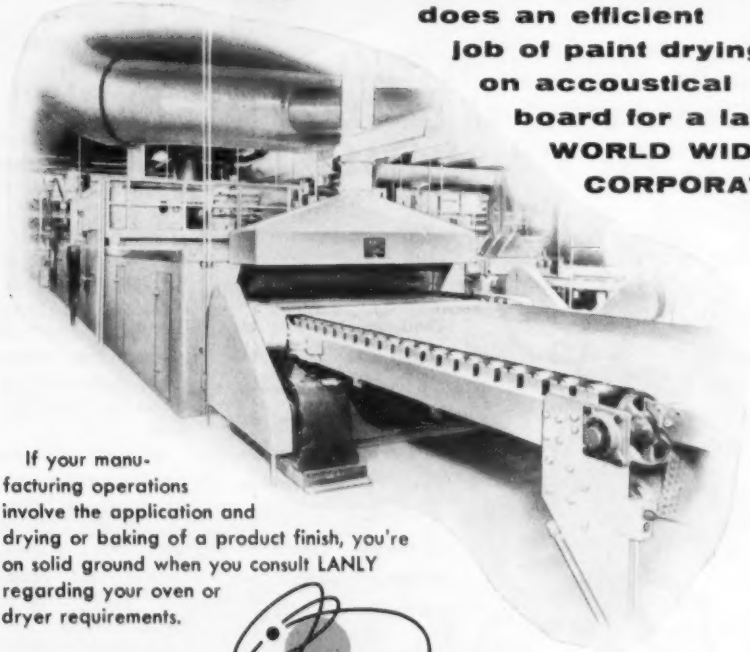
★ ★ ★

Neutral Trichlorethylene Degreasing Solvent

Description: Dow Neu-Tri is the latest member of a line of trichlorethylene degreasing solvents. It is tailored for operations that require a neutral rather than alkaline degreasing solvent. Other solvents in this group include Hi-Tri, a high-purity type that has excellent shock sensitivity and freedom from residue; and Alk-Tri, which is recommended for most applications, especially those where

This Lanly Conveyorized Lay-Down-Dryer

does an efficient job of paint drying on accoustical board for a large WORLD WIDE CORPORATION



If your manufacturing operations involve the application and drying or baking of a product finish, you're on solid ground when you consult LANLY regarding your oven or dryer requirements.

Find Your Representative In The Yellow Pages

THE Lanly CO.

FINISHING OVENS

2800 Euclid Avenue • Cleveland 15, Ohio

LANLY welcomes a discussion of your drying and baking operation problems. Write for Catalog No. 560 and get better acquainted with our organization.

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stabilizer control is critical.

Manufacturer: Dow Chemical Co., Chlor-Alkali Sales Dept., Midland, Michigan.

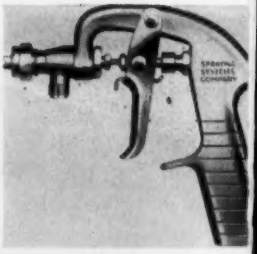
For more data circle 8 on Reader Service Card

★ ★ ★

Chemical-Resistant Spray Gun

Description: A spray gun designed so that a minimum number of parts come in contact with the liquid being sprayed is useful for operations requiring the use of a portable, manually operated spray gun.

Spraying Systems Gunjet No. 22



★ ★ ★

The small number of parts in contact with the liquid limits the number of parts that must be made of chemical resistant materials. Various combinations of metals are available for construction of the gun, depending upon the application.

Several types of orifice tips are available, in brass and stainless steel. Tip types include flat spray, cone jet spray, full cone, disc type and solid stream. Each type is offered in a wide choice of capacities. Tips are easily changed.

Gun has large, comfortable trigger grip and handle. Trigger lock is easily engaged

THE ONLY DIFFERENCE BETWEEN A RUT AND A GRAVE IS THE DIMENSIONS!
ALKALI IKE
AND, our biggest challenge today is to continue to develop for your use to-morrow a thoroughly modern, efficient and economical line of metal finishing products. Our success in the past is the best recommendation for future performance!
A Complete Line of Cleaning Compounds for the Metal Finishing Industry.
Apex ALKALI PRODUCTS CO.
Main and Rector Streets • Philadelphia 27, Pa. • IV 3-3939
SYRACUSE BOSTON DETROIT ATLANTA PITTSBURGH WEST HARTFORD

For more data circle 356 on Postpaid Card

HOT SPRAY IMPROVES QUALITY, CUTS COSTS AT GIBSON REFRIGERATOR COMPANY

In 1957 Gibson Refrigerator Company reduced the number of primer coats on air conditioner parts from two to one and got a better finish by switching to Spee-Flo Hot Spray at their Belding, Mich., plant. Again, in 1958, with additional Spee-Flo units and a special enamel, they were able to adopt a single, combination primer-finish coat process. *Result*: further improvement in appearance and service life and still greater economies.

Invariably Spee-Flo users report improved coverage, elimination of runs and sags, faster drying, a longer lasting, better looking finish. And with these quality improvements, they get a bonus of saving in time and materials, with virtually no maintenance cost for equipment. Ask for an on-the-job demonstration.

Find out what Spee-Flo Hot Spray Systems can do for you. Write for free case history booklet: "Why Hot Spray?"

THE SPEE-FLO COMPANY

6614 HARRISBURG, HOUSTON 11, TEXAS

122

For more data circle 357 on Postpaid Card

and disengaged. Spray control is instantaneous and positive. The gun is designed for pressures up to 800 p.s.i.

Manufacturer: Spraying Systems Co., 3229 Randolph St., Bellwood, Illinois.

For more data circle 9 on Reader Service Card

★ ★ ★

Automatic Turn-Around Mechanism for Anodizing Racks

Description: An automatic turn-around mechanism turns racks from one side to the other at loading and unloading stations, makes it easier to load and unload parts being anodized.

A swivel device turns the racks so that all parts can be racked from one side of the monorail. The racks are carried on a monorail to the anodizing machine, where an automatic loader transfers the racks to the

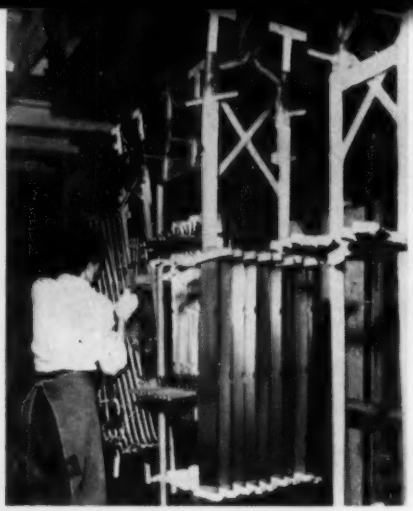


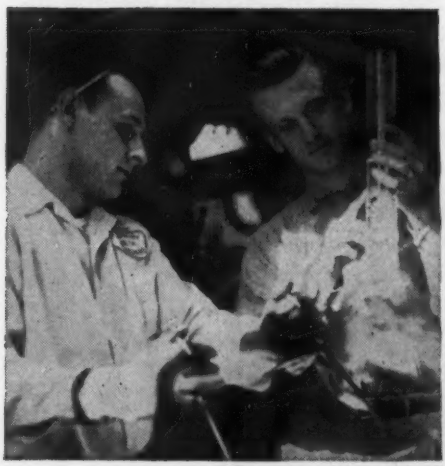
Fig. 1—Racking parts for anodizing is made easier by swivel that turns rack so that it can be loaded from one side of conveyor.

50 TIMES LONGER WEAR! WORKLON

Acid and Caustic Resistant INDUSTRIAL APPAREL

of DuPont ORLON • DuPont DACRON • Union Carbide DYNEL • LINT-FREE 100% ORLON

SAVINGS UP TO 93%



Worklon work clothes resist punishing acids and chemicals . . . actually outlast cotton and wool garments by 50 to 1 as proved in on-the-job tests under corrosive chemical conditions. No need for constant replacement of acid-damaged uniforms! Worklon apparel wears far longer, saves you as much as 93% in work clothes costs!

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Please send me the new Worklon Catalog FREE!

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WORKLON

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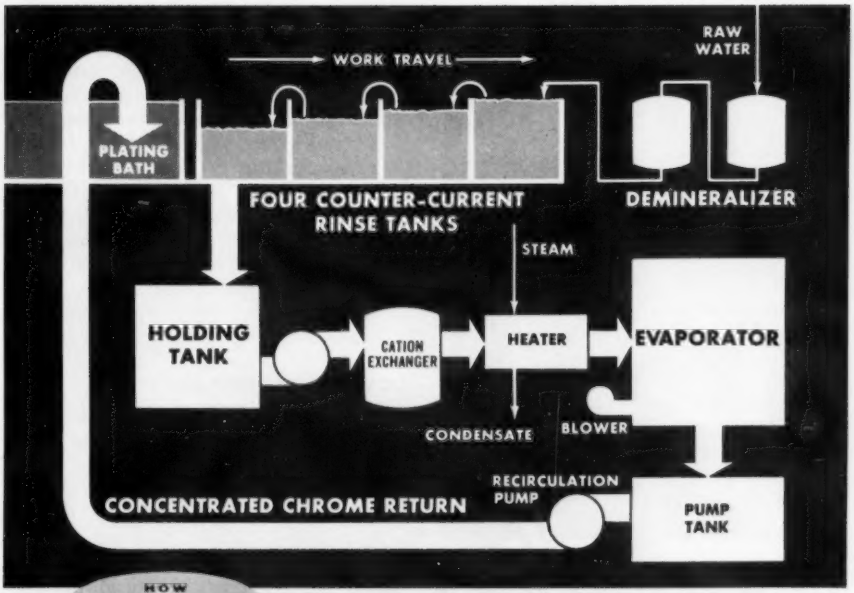

HOW INDUSTRIAL ENGINEERING PAYS OFF...

Recovering Chromic Acid at Less Cost than Destroying it

The Chromic Acid Recovery System diagrammed above was engineered by INDUSTRIAL for a large automotive plant. It was developed after a *thorough analysis* of the entire plating operation indicated that desired efficiency would be reached by reducing the rinse water flow rate. When this was done, rinsing was still efficient and complete, with less than 4 ppm acid concentration in the final tank . . . but the higher concentration in the first tank made it possible to use a fast, conventional evaporator to recover Chromic Acid. No pre-concentration was necessary (the small cation exchanger only removed metal contaminants).

After making a careful analysis of operating costs, including labor, power and amortization, as compared with a destruction system of equal capacity, The INDUSTRIAL Recovery System showed a net *GAIN* of $26.65 per day, against destruction *COSTS* of $54.06 per day!

Here, then, is another good example of how INDUSTRIAL engineering pays off by increasing plating efficiency and economy.

INDUSTRIAL FILTER & PUMP MFG. COMPANY
5904 Ogden Avenue, Chicago 50, Illinois

INDUSTRIAL

P-258R

Call or write INDUSTRIAL to find out how an engineered system like this can solve your specific plating waste and recovery problems.

PRESSURE FILTERS • ION & HEAT EXCHANGERS • WASTE-TREATING EQUIPMENT

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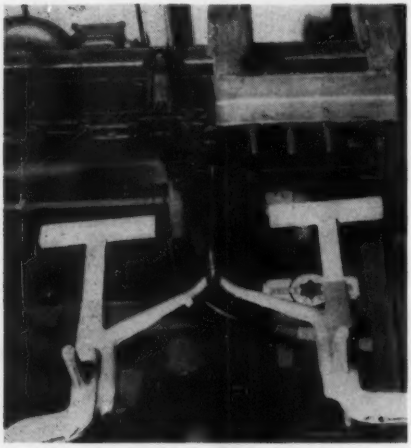


Fig. 2—Closeup of swivel device shows how it turns rack from one side to the other as teeth on swivel wheel are engaged by pins.

anodizing machine. After anodizing, racks of anodized parts are automatically transferred to another monorail. Another turn-around mechanism is employed at the unload station, so that these parts also can be unloaded by one operator.

In operations where stripping of racks is not necessary, load and unload monorails may be continuous.

Manufacturer: Hanson-Van Winkle-Munning Co., Matawan, N. J.

For more data circle 10 on Reader Service Card

★ ★ ★

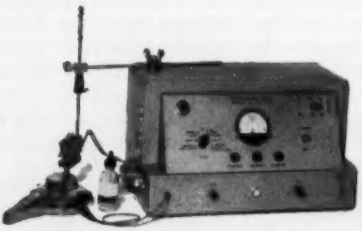
Low-Temperature Phosphatizing Process

Description: "Cold Bonderite" system makes it possible for sheet metal products to be phosphatized at substantially lower temperatures.

Advantages of operating phosphatizing tanks at lower temperatures: reduced heating costs, reduced maintenance, shorter heat-up time, increas-

Test CHROMIUM-NICKEL-COPPER over ZINC DIE-CAST with Model 955 . . .

Here's a new test which has been added to many applications of the Kocour Electronic Thickness Tester. You can obtain separate thickness readings of Chromium-Nickel-Copper over zinc base die-cast. In addition you can test thickness of heavy or decorative chromium, silver, tin, cadmium, zinc, brass, copper, nickel, lead, and other alloy deposits on various basis metals with an accuracy of 90-95%. Write for literature.



ASK FOR A DEMONSTRATION OR 15-DAY FREE TRIAL!

KOCOUR CO.
4814 S. St. Louis Ave.
Chicago 32, Illinois

Model TT owners . . . Note!

If you now have a Model TT, any series, the new test is available to you. Ask for prices and instructions on the New Solution R-52.

For more data circle 360 on Postpaid Card

Get exact quality control for all organic finishes!

Steinemann BY KOCH

the amazing PRESSURE CURTAIN COATER

Fast, economical and uniform
Flat, profiled and moderately curved work can be coated without the need for re-setting the machine.

Precise adjustments provide uniform coating in grooves, on edges same as on flat surfaces. Machine is readily adjustable to coatings of .5 to 100.0 mil thickness.

No spray! No splash! No waste!
Excess finishing material is returned directly to the reservoir to be used over again.

Cleaned easily **Set up** quickly . . . for different colors, different sizes of work, different material.

Critical coating control is maintained by . . .
1. Variable-speed conveyor belts
2. Pressure in pouring head
3. Width of pouring slots
4. Height of the pouring head

write for data file SIF-5

Stop all obsolete coating methods! Plan now to use this amazing new patented Swiss machine for flat ware coatings. Clear or pigmented lacquers, varnishes, polyesters or synthetics and many other liquid materials are poured in a vertical film from adjustable orifices as the work travels through the machine. Strict controls over pressure, speed and viscosity produce a uniform coating that is matchless by any other method.

Manufacturers of wood or wood products contact . . .
WILCO Machine Works, Inc.
Box 3722 — Municipal Airport
Memphis, Tennessee

Metal-working and allied industries . . . phone, wire or write . . .

GEORGE KOCH SONS, INC. Evansville 4, Indiana

For more data circle 361 on Postpaid Card

ed worker comfort.

Manufacturer: Parker Rust Proof Co., 2172 E. Milwaukee Ave., Detroit 11, Mich.

For more data circle 11 on Reader Service Card

★ ★ ★

Printed-Circuit Finishers

Description: Two Clair surface finishing machines (Models No. 203 and 209) have been modified to meet the specialized demands of printed circuitry manufacture. These modifications improve the machines' ability to remove "mold release" from the plastic prior to copper plating; clean copper-clad laminate prior to etching; and remove resist and clean copper after etching.

Model No. 209 is a pinch-roll, through-feed design. Capacity of this machine varies according to the amount of corrosion, roughness and other variables. With the proper conveyor equipment or automatic discharge stacking, one operator can keep this machine operating at normal capacity (20 to 40 linear f.p.m.)

Model No. 203 incorporates a reciprocating table, which holds the work either by vacuum chucks or mechanical means. This machine is advantageous if the amount and degree of corrosion varies, since the work is visible to the operator and he can repeat the operation if he sees that it is necessary to completely remove corrosion.

Both Clair machines incorporate identical interchangeable spindles and rolls, which can be replaced quickly when necessary. Each is equipped

H. W. Kramer
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BUFFING LATHE
1 to 7½ H.P. Ball Bearing V-Belt Drive. Pre-determined speed set at factory or to your specifications. Buffing wheels and compounds available for every industry . . . Special compounds recommended for Special applications.
SINGLE BARREL TUMBLER
Size: 30" x 36" or engineered to your specifications. Barrels lined with kiln-dried and glued maple. Child's play to operate. Economical on space as motors are individually mounted overhead—double decked or single. Tumbling supplies available also.
Write Dept. GF for Detailed Information
H. W. KRAMER CO.
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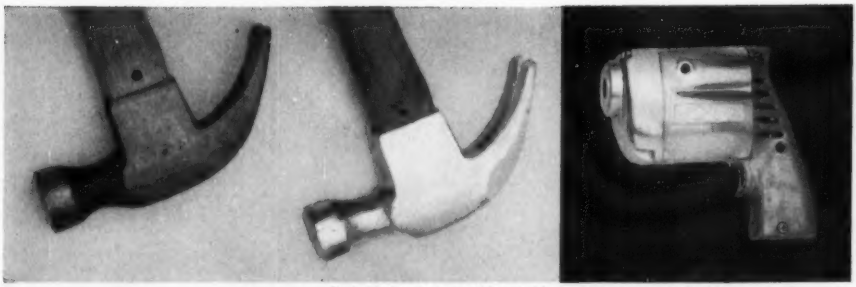
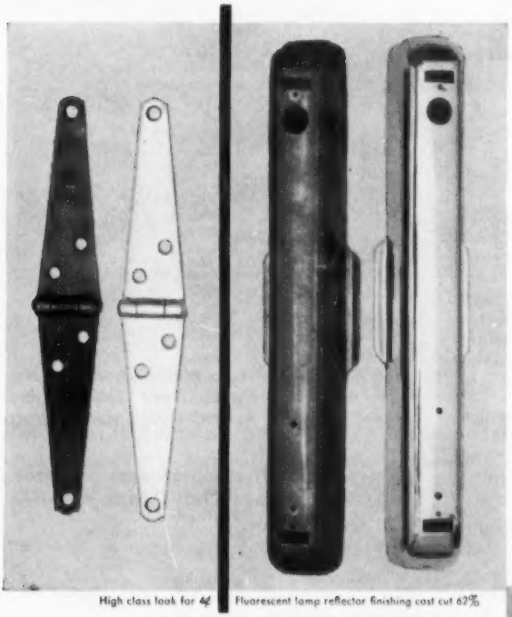
RICHMOND HILL 18, N. Y.

For more data circle 362 on Postpaid Card



Shelf appeal can be increased for only 3¢ Finishing costs reduced to 12¢

If It Looks Good... It Sells Better



High class look for 4¢ Fluorescent lamp reflector finishing cost cut 62%

If you're looking for a way to increase the sales appeal of your products by adding a quality appearance at low cost, you should investigate vacuum coating.

While this modern process is not a cure-all, most likely you'll find it will add new life to the items you manufacture — and may cut your costs spectacularly, too! Brilliant, eye-catching, metallic finishes, in a wide range of colors, can be applied on plastics, metals, wood, glass, paper, fabrics and many other materials. Today's vacuum coatings are brighter than buffed and polished electroplating, cost less, and in some applications stand up better.

You don't have to take chances, either. Send us a sample of your product and give us details about its use. We'll tell you whether your application is a good one, show you how your product will look, and estimate your costs. Then, if you want, we'll supply a complete installation, guarantee its output, show you how to run it efficiently, and even train your operators. Write us today!

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Chemically...

POLISH any shape ALUMINUM

IN 60 SECONDS OR LESS AT FAR LESS COST WITH...

ALCHEMIZE

- Polishes intricate shapes
- Improves product appearance
- Saves time and labor costs
- Increases your profits
- No electricity required

IT'S QUICKER . . . SAFER. Alchemize is a chemical polishing process providing an economical method of obtaining satin to mirror-bright finishes on any shape aluminum. Brightens and levels, simultaneously, by simple immersion. Not to be confused with the usual "bright dip." Alchemize smooths and polishes components at FAR LESS COST.

SIMPLE . . . EASY TO USE. Alchemize is shipped as a concentrate. Solution make-up: 5% Alchemize Concentrate and 95% phosphoric acid (available locally).

FREE SERVICES. Engineering service available. Sample piece "Alchemized" for you without charge. Equipment layout and cost analysis furnished. Special methods and finishes developed. Send for full details.

Alchemize CORP.
1429 S. Talman Ave. · Chicago 8, Ill.

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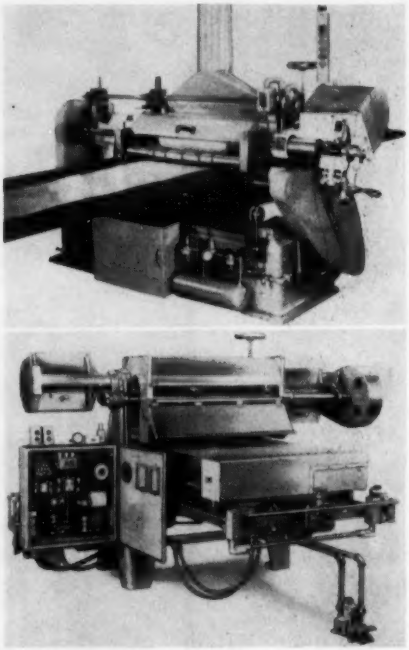
with air floating spindles that assure uniform contact pressure at any predetermined setting.

Both machines also have multiple safety devices and automatic controls



Clair Surface Finishing Machines: Model No. 209 Pinch-Roll Through-Feed (above) and Model No. 203 Reciprocating-Table (below)

to protect both machine and operator.

Manufacturer: Clair Manufacturing Co., Inc., Olean, N. Y.

For more data circle 12 on Reader Service Card

★ ★ ★

Battery-Operated Thermocouple Vacuum Gage

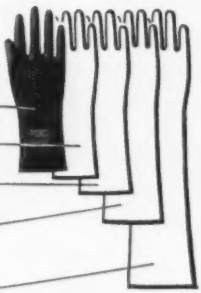
Description: A vacuum gage designated Type GTC-110 is powered by a 1.5-volt flashlight battery, covers

These Stanzoil® Milled Neoprene Gloves

. . . Guarantee Positive Liquidproof Protection in 103 Basic Oils, Acids, Caustics, Greases, Solvents

Black All Neoprene Stanzoils With Non-slip Grip

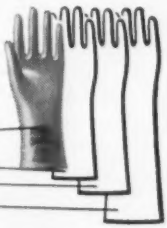
Model	Weight	Fingers	Length
N-31	Light	Straight	10½"
N-35	Light	Curved	10½"
N-32	Medium	Straight	11"
N-36	Medium	Curved	11"
N-41	Heavy	Straight	12"
N-44	Heavy	Curved	12"
N-51	Heavy	Straight	14"
N-33	Light	Straight	14"
N-54	Heavy	Curved	14"
N-71	Heavy	Straight	18"
N-73	Light	Straight	18"
N-74	Heavy	Curved	18"



White All Neoprene Stanzoils With Smooth Finish

Model	Weight	Fingers	Length
N-30	Light	Curved*	10½"
NW-31	Light	Straight	10½"
NW-32	Medium	Straight	11"
NW-41	Heavy	Straight	12"
NW-51	Heavy	Straight	14"

*Non-slip



FREE Hand Protection Analysis... Send a description of your job requirements (length, dexterity, wear resistance, chemicals used, importance of safe grip, hot or cold temperature extremes, fatigue factor and sizes) to our "Hand Protection Clinic." New catalog and price list available on request.

the **PIONEER** Rubber Company
285 Tiffin Road
Willard, Ohio

For more data circle 365 on Postpaid Card

range from 0-1000 microns on one non-linear scale, with 5 microns as the smallest indicated marking. The compact cabinet-mounted gage is operable as a moderately sensitive leak detector throughout its range.

Bulletin No. P9-39, available from the manufacturer, gives details.

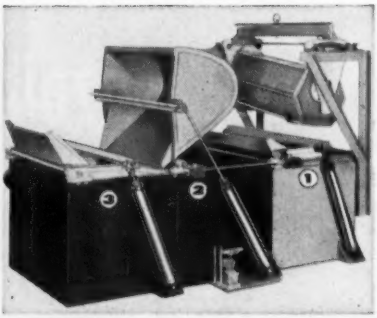
Manufacturer: Rochester Div., Consolidated Electrodynamics Corp., 1775 Mt. Read Blvd., Rochester 3, N. Y.

For more data circle **13** on Reader Service Card

★ ★ ★

Air-Operated Rinse Hoppers

Description: A recently introduced unit for liquid processing automatically raises and lowers hopper loads of small parts in and out of tanks. The perforated hoppers are suitable for immersing parts into rinse, chromate coating and bright dipping solutions.



Belke Three-Tank Air-Operated Rinse Hopper: raises and lowers loads of small parts

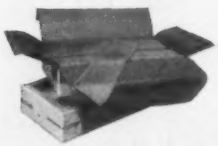
Independently operated air cylinders on each side of the individual tanks

For Dust Free Finishes!

BOND TACK CLOTH

IN ROLLS

Cut off any size piece to use as needed.



IN BULK

Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available In Rolls or Cut Bulk—White or Gold

In Four Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up! Choice of Standard, Extra Tacky or Less Tacky, as desired.

The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" or 9" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free and Wax-Free.* Gives a sparkling speck-free Finish *every time.* Clean and Sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

"The Tacky Wiper Specialists"

Bond® **CHEMICAL PRODUCTS CO.**

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ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES —144 to the Carton

A WARRANTY OF SATISFACTION IN EVERY CARTON

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Take a good look at UNICHROME

COATING 6400

... a sprayed organosol finish with unique texture and long life

Any product with UNICHROME COATING 6400 *invites* a second look. Not only does this finish show an interesting texture similar to costly grained leather, but it also has the ability to *keep* this eye appeal long after lesser finishes have deteriorated.

COATING 6400, which is available in a wide variety of colors, has the high chemical resistance of a vinyl coating to acids, alkalies, moisture and other causes of finish failure. It is a hard, yet flexible and chip-proof coating . . . surpassing the textured baked-enamel type of coating in wear resistance by as much as 10 to 1. Applied by spraying, it builds a film 8 to 40 mils thick, depending on number of coats.

COATING 6400 *looks* quality . . . proves it by standing up in hard service . . . precisely the requirements for such quality products as business machines, office furniture and others. Send for detailed information.

PLATING MATERIALS
ORGANIC COATINGS
TIN & TIN CHEMICALS
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WELDING SUPPLIES
METALS & ALLOYS
HEAVY MELTING SCRAP

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GENERAL OFFICES: RAHWAY, NEW JERSEY

Pittsburgh • Atlanta • Detroit • East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.

For more data circle 367 on Postpaid Card

supply power for raising and lowering the hoppers automatically, semi-automatically or manually.

Hoppers are fabricated of materials suitable for the application. Rinse tanks are available in a complete range of sizes. Literature completely describes these units.

Manufacturer: Belke Mfg. Co., 947 N. Cicero Ave., Chicago, Ill.

For more data circle 14 on Reader Service Card

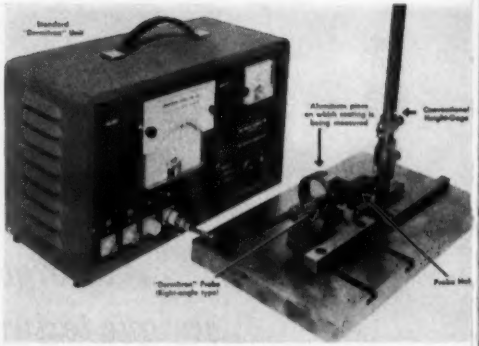
★ ★ ★

Coating Thickness Tester

Manufacturer: Unit Process Assemblies, Inc., 61 E. Fourth St., New York 3, N. Y.

Equipment: Dermitron Model D-2 Non-Destructive Thickness Tester.

Features: Special probe allows accurate measurement of coating thickness on inside diameters. Based on eddy-current principles, this instrument is available with any one of four standard probes or four right-angle probes, for extra-wide thickness ranges. Requires area only ⅛ inch in diameter for measurement.



Dermitron D-2 with Right-Angle Probe measures hard anodic coating on internal diameter

To page 114→

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Why only ONE rack?..... When you can handle TEN!

JOB SHOP VERSATILITY WITH AUTOMATIC PRODUCTIVITY

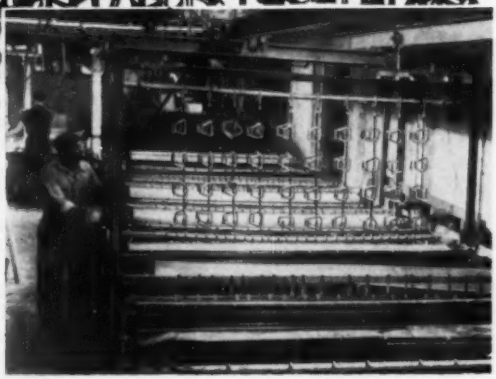


Photo shows jobbing shop with 3 men processing 9'0" work bars through 21 tanks handling 250 racks per hour.

One-sixth labor of hand plating, plates any finish, in any sequence, any size work at any time. Time in tanks independently variable. Any tank may be by-passed at any time. Any length, width or depth tank. Saves floor space, low headroom. Only 25% more investment than hand. Saves material, controlled withdrawal, better control, cleaner, dryer. Work bar carries work through process. Work bar does not block removal or placing of work in tank. Air operated hoist is easily controlled, completed work easily transferred to monorail conveyor for unracking and reracking.

SOLBERN MFG. CORP. DIV. OF EISENBERG INDUSTRIAL CONTRACTING CO.

120 - 13TH STREET • BROOKLYN 15, N. Y. • HYacinth 9-7700

For more data circle 369 on Postpaid Card

Choosing the most profitable cleaning chemical

No operation in metalworking today—even the most routine—can escape the probing eye of the cost accountant. Take metal cleaning. The simplest cleaning setup is not necessarily the most economical . . . neither is the cheapest cleaning agent. Dow offers a wide variety of chemicals for the cleaning job. Each is more useful than the others in a specific type of operation. Making the right choice can mean fewer rejects on the line and more dollars in the till. Some of these chemicals are discussed in concise form for the busy reader.

Metal cleaning men cover all bases with Dow trichloroethylene line

In metalworking plants that aren't watching pennies these days, any old trichloroethylene in the vapor degreaser will do. But those who want the most for their money are glad they can choose the one type that suits their operation best.

And that's a choice they can easily make from the impressive array of trichloroethylene types offered by Dow. Here's the line-up, each with its individual qualifications—together as a group, covering 99% of all metalworking applications.

NEU-TRI. Just released for general distribution—Dow's neutral type of trichloroethylene is an outstanding cleaner for both ferrous and nonferrous metals. Its excellent stabilizer system prevents breakdown when working with buffing, stamping and drawing compounds and other contaminants. NEU-TRI* is recommended for the broad range of industrial jobs. Its versatility makes it the best solvent for many different applications.

Metal components ready for assembly line after degreasing with Dow Trichloroethylene.

Like all types of Dow trichloroethylene, NEU-TRI has a low fire hazard (no flash or fire point) and is low in toxicity . . . a safe citizen. Its low boiling point (189°F.) makes for easier handling of the work after degreasing and keeps heat bills to a minimum. In fact, it takes only one-ninth the heat to boil and vaporize NEU-TRI as it does water. This means less heat input and more economical cooling.

The high vapor density of NEU-TRI helps maintain a definite vapor level and reduces the amount of solvent dragout during work transfer. Most important, the powerful cleaning ability of Dow trichloroethylene makes the most stubborn parts come clean after just one run. Cleaning line rejects are cut to the bone.

Dow Chemicals Basic to the Metalworking Industry

Chlorinated Solvents • Brominated Aliphatics
Alkalies • Ion Exchange Resins • Glycol Ethers
Preservatives • Hydrochloric Acid • Phenolsulfonic Acid • Ammonia • Industrial Glycols
Polyethylene Glycols • Polypropylene Glycols

ALK-TRI. As the name suggests, this is the alkaline member of the family. ALK-TRI* offers a definite metal cleaning advantage. Metal cleaning men can easily determine the condition of the solvent stabilizer balance. This definite advantage allows for top performance in your metal cleaning operation.

HI-TRI. Missile makers *really* play for keeps when it comes to metal cleaning. Undetected foreign matter in the business end of a rocket can raise havoc. This type of tri was developed by Dow for specific use in the missile industry. Its excellent "shock sensitivity" characteristics, freedom from residue, qualify HI-TRI* as a top-rated cold flushing agent in cleaning missile components.

Stripper Extraordinary

METHYLENE CHLORIDE

Formulations based on Dow methylene chloride lay metal bare in short order, rapidly stripping paints, enamels, lacquers, epoxy resins and plastic coatings. They permeate practically all coatings, swelling and lifting them right off the surface. They excel at removing plating masking lacquers and cleaning precision parts.

Dow methylene chloride performs efficiently as a spray or dip, and in certain vapor degreasing applications. The list of its attributes is long and includes high solvency, low boiling point, inertness to metals, chemical stability, nonflammability and low vapor toxicity.

WHAT DO YOU THINK? Reading about these helpful Dow chemicals for metalworking may have suggested some ideas or questions about your own operation. If you'd like more information or have some comments, please write to: THE DOW CHEMICAL COMPANY, ***Chemicals Sales Dept. 762G, Midland, Mich.*** *TRADEMARK

YOU CAN DEPEND ON

DOW

METALWORKING MEMO:

4 more noteworthy Dow chemicals

S. O. S.

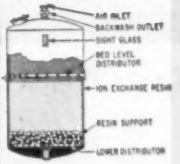
Many formulators are now adding Dow Sodium Orthosilicate to their product lines for consistently high-power metal cleaning. Contact Dow for formulators using Dow S.O.S.

Perchloroethylene

A top notch vapor degreasing solvent for cleaning prior to plating. High boiling point means longer solvent action before part reaches condensate temperature.

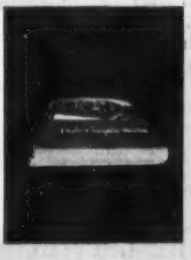
Ion Exchange Resins

In pickling and plating plant operations, Dowex® resins keep valuable metal from going down the drain . . . reduce water pollution problems, too.



Caustic Soda

Complete handbook on NaOH. Facts, figures and tables on properties, uses, handling, storage, safety measures. Send postcard for your copy.



For more data circle 370 on Postpaid Card

Typical Applications: Checking hard anodic coatings on internal diameters; checking other types of coatings on various surfaces.

For more data circle **15** on Reader Service Card

★ ★ ★

Paint Fungicide

Description: Dowicide 6, a fungicide that is added to paint to make the paint film more resistant to mold formation, has recently been altered by a patented improvement that makes the principal ingredient of this fungicide (tetrachlorophenol) more free flowing. About 3 per cent of this product in paint is required to render the paint film mold resistant.

Manufacturer: Dow Chemical Co., Midland, Mich.

For more data circle **16** on Reader Service Card

★ ★ ★

Fingerprint Preventive

Description: A skin cream (Milburn's Ply No. 9 Liquid) contains ingredients that help to counteract the corrosive effects of fingerprints on polished metals and electroplates.

The cream retards corrosion by depositing anti-corrosives on the skin, which are carried onto the parts by the worker's perspiration. The anti-corrosives thus help to counteract corrosion.

Manufacturer: Milburn Co., 3246 East Woodbridge, Detroit 7, Mich.

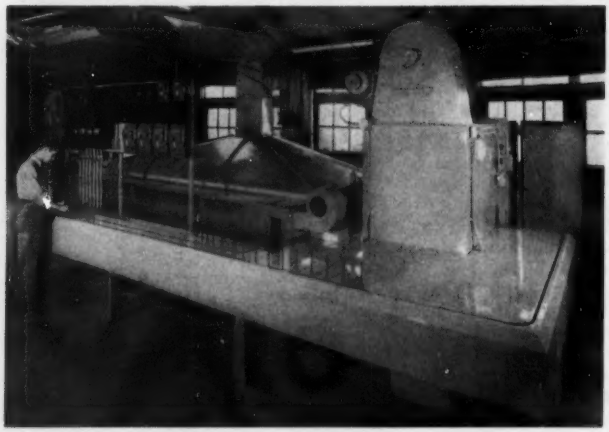
For more data circle **17** on Reader Service Card

★ ★ ★

Emulsion Cleaner

Description: Emulsion Cleaner 62 removes heavy oils, films and solid dirt from metals prior to

PEN CAPS TO VACUUM CLEANER TANKS



Spray-Baked Finishes at low cost on a complete *Capitol Machine*

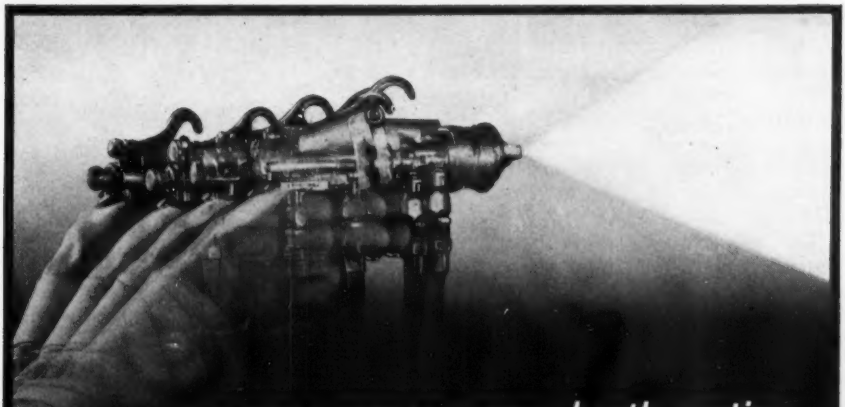
The Capitol Spray-Bake Conveyor Machine produces a high quality finish at exceptional savings on pieces from 1" to over 12" in diameter . . . at swift production speeds. Item is automatically sprayed, continues on workholder through drying chamber for solvent evaporation, then into electric strip-heated bake oven in one trip on one complete machine.

Capitol installations handle all kinds of odd shapes such as: shell noses and cartridges, clocks, pens and pencils, hardware, cosmetic cases and difficult flat objects. Two spray booths and ovens are available for double coating operations.

Let a Capitol engineer recommend the right machine to meet your requirements. Write for full information:

THE CAPITOL MACHINE CO. 36 BALMFORTH AVE. DANBURY, CONN.

For more data circle 371 on Postpaid Card



BOOTH-STRIP® spray booth coating covers completely with one pass of the gun

Because a single coat of BOOTH-STRIP is all you need, you get about twice the coverage per gallon, and it takes about half as long to apply. *That means lower labor cost, less down time of spray booth.*

- **BOOTH-STRIP sprays on faster than a square foot per second. Covers entire booth in minutes. *Three-mil coat has tensile strength of 3,000 psi.***
- **Comes ready to spray with standard equipment. No mixing or thinning. Equipment cleans with tap water.**
- **Dries opaque white to improve visibility.**
- **Water-based, completely fire-safe and non-toxic.**

STRIPS OFF EASILY WITHOUT TEARING
Large areas of BOOTH-STRIP peel off readily in one piece from even the most irregular surfaces. Leaves spray booth clean as new.

Start saving money on spray booth housekeeping. Order a trial gallon of BOOTH-STRIP today.

SPRAYLAT CORP.
One Park Avenue, New York 16, N. Y.

For more data circle 372 on Postpaid Card

plating or painting operations.

This material is furnished as a concentrate or in ready-to-use form. It is used at room temperature in plain steel tanks. Parts are cleaned by immersing in the solution for five to 60 seconds.

The recently introduced cleaner is neutral, will not attack such reactive metals as aluminum, zinc, brass or magnesium. Literature is available from the manufacturer.

Manufacturer: Enthone, Inc., 442 Elm St., New Haven 11, Conn.

For more data circle **18** on Reader Service Card

★ ★ ★

Wet-Film Thickness Gage

Description: Wet-Film Thickness Gage WFG-100 measures the thickness of any wet film of paint, varnish, adhesive, plastic or other similar finishing material.

Nordson Thickness Gage: checks wet films

The instrument is simple to use. A calibrated precision-ground face plate is rotated to the point that matches the estimated wet film thickness. With two motions, an accurate measurement is obtained. Range: ½ to 20 mils.

Manufacturer: Nordson Corporation, Amherst, Ohio.

For more data circle **19** on Reader Service Card

Rhodium
ELECTROPLATING SOLUTIONS

Backed by 57 Years of Specialization

Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.

Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits... Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.

Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.

Write for new informative booklet "The General Properties of Rhodium" sent without charge... Consult our staff about your plating problems.

Since 1901

SIGMUND COHN MFG. CO., INC.
121 SOUTH COLUMBUS AVENUE · MOUNT VERNON, NEW YORK

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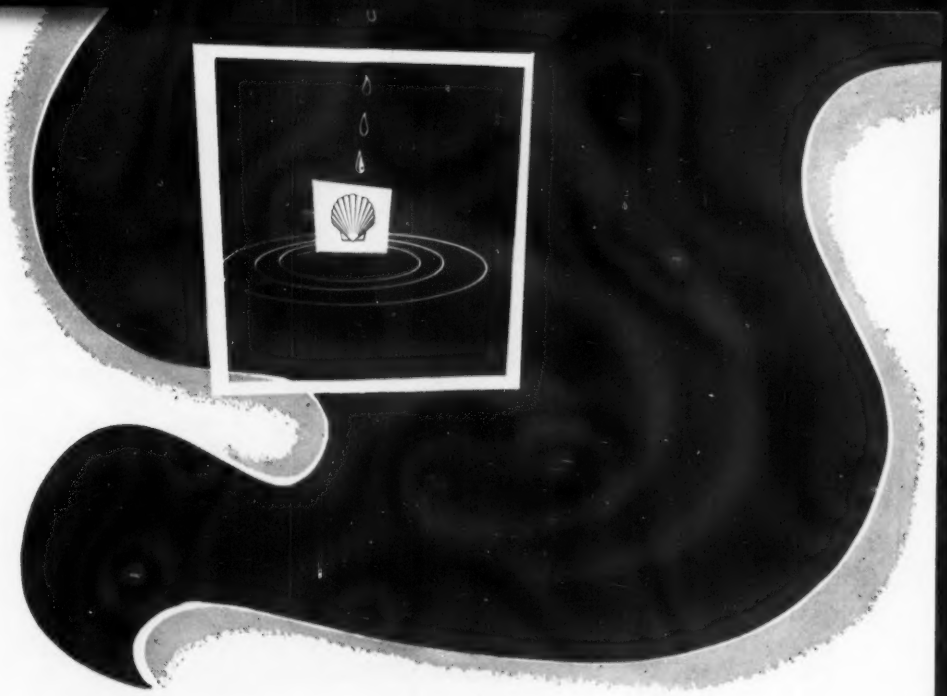

EAK . . . higher solvency means better coatings at lower cost!

HIGH BOILING EAK . . . with its *high solvency* or nitrocellulose and most organic resins . . . is finding steadily increasing use in a variety of surface coating formulations.

Ethyl amyl ketone teams up with low-boiling MEK and medium-boiling MIBK to provide better flow and gloss and helps to eliminate dry overspray.

Also, EAK's slow evaporation rate helps minimize pinholing and bubbling in the film. It possesses superior blush resistance and good diluent tolerance.

EAK is also an important component of thinners for automotive, furniture and other lacquers. This high-boiler is also being used successfully in multi-color lacquers. Cellulose esters, vinyl polymers and virtually all synthetic and natural resins are soluble in EAK.

And, EAK is now proving itself as a valuable intermediate in several industries.

Your Shell Chemical representative will be glad to discuss your specific solvent needs with you. Write for ORGANIC CHEMICALS, a catalog of Shell solvents, resins and intermediates.

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

SHELL

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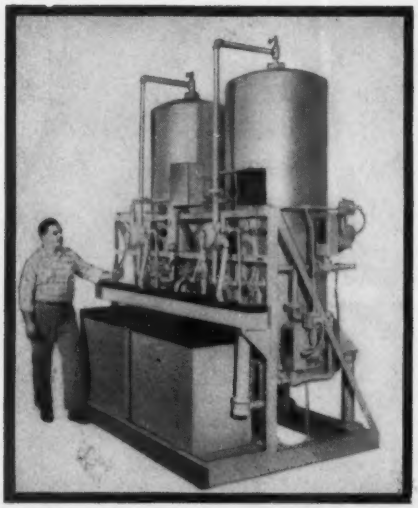


BARNSTEAD DEMINERALIZERS FOR METAL FINISHING IN CAPACITIES OF FROM 30 to 2500 G.P.H.

In rinsing or plating . . . in anodizing or make-up . . . in fact, wherever pure, mineral-free water is a necessity . . . Barnstead Demineralizers can save you money. First, because they are versatile: they come in all sizes from 30 to 2500 gallons per hour and in mixed-bed, two-bed, and four-bed models. Second, because they are low-cost in operation, producing pure water for as little as 5c per thousand gallons. Third, you get authoritative answers from Barnstead — with over 75 years' experience in ALL phases of producing pure water for all industrial applications.

NEW LITERATURE:

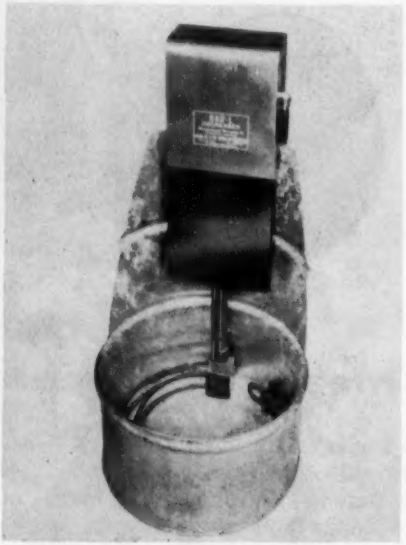
Catalog 127-A illustrates Barnstead's complete line of water demineralizers, and presents factual information which can help you reduce waste and save money.

Barnstead
STILL & DEMINERALIZER CO.

12 Lanesville Terrace, Boston 31, Mass.
For more data circle 375 on Postpaid Card

Portable Degreaser

Description: The Bar-L, a compact electric heating unit, fits in any standard drum, converting it to a vapor degreaser that can be moved anywhere in the plant for on-the-spot cleaning jobs. As a production unit, it has a 700-pounds-per-hour cleaning capacity. Will permit cleaning of any part up to 17 inches in diameter by 16 inches deep. Plugs into any electric outlet. Available with vapor condenser. Catalog sheets provide full description.



Cutaway View: Manpro Bar-L Vapor Degreaser

Manufacturer: Manpro Corporation, 1362 Hilton Rd., Detroit 20, Mich.

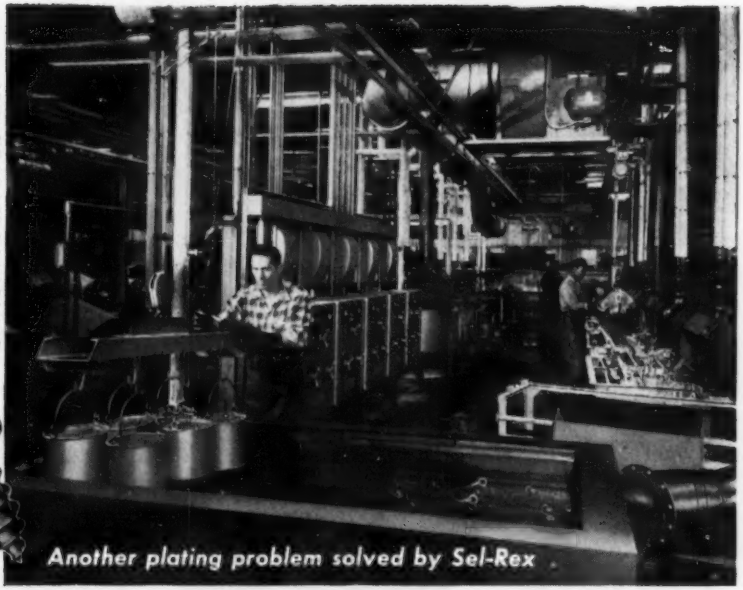
For more data circle **20** on Reader Service Card

★ ★ ★

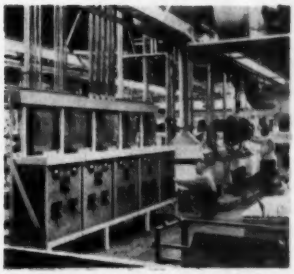
Abrasive Blast Media for Plastic Flash Removal

Description: Cob grits can be used in abrasive blasting equipment to remove flash from phenolic, polyester, urea and melamine thermosetting plastic parts.

View of monorail-automated Parker-Kalon plating facilities designed and laid-out with the assistance of Sel-Rex Engineers. Parker-Kalon has standardized with Sel-Rex plating equipment and supplies which help them to attain the quality for which P-K fasteners are famous the world over.



PARKER-KALON INCREASES PRODUCTION AND IMPROVES PLATING QUALITY WITH FIVE SEL-REX RECTIFIERS



Sel-Rex Remote Controllers shown above connect to three 16 Volt, 3000 ampere, and two 12 Volt, 2000 ampere Sel-Rex Selenium Rectifiers installed on the roof of Parker-Kalon's new 267,000 square-foot plant.

The world's leading manufacturer of self-tapping screws, Parker-Kalon division, General American Transportation Corp., Clifton, N. J., electroplates billions of screws a year in the extensive facilities pictured above. The dependable D.C. power for this tremendous operation is supplied by 5 SEL-REX Selenium Rectifiers, remotely controlled.

According to Mr. H. Rosenberg, works manager, these SEL-REX Rectifiers not only increased production appreciably, but also improved the quality of zinc, cadmium, nickel, copper and brass plating of their wide range of standard and special fasteners. SEL-REX also had the pleasure of working closely with Parker-Kalon engineers in layout and design of the special electroplating equipment required by this exacting application.

Whatever your plating problem — power, precious metals, equipment, plant layout or procedures — SEL-REX Representatives are trained to "Custom Engineer" solutions to our mutual profit. Send for FREE technical data and other case histories, and see for yourself ... we may have solved your problems last month.

Sel-Rex®

SEL-REX CORPORATION

NUTLEY 10, NEW JERSEY — OFFICES: DETROIT, CHICAGO, LOS ANGELES

Manufacturers of Exclusive Precious Metals Processes, Metallic Power Rectifiers, Airborne Power Equipment, Liquid Clarification Filters, Metal Finishing Equipment and Supplies

For more data circle 376 on Postpaid Card

The cob-grit media is said to produce parts with excellent gloss; have little tendency to stick in holes and slots; leave little dust on the deflashed parts; have little tendency to powder or to adhere electrostatically to the plastic parts. Savings in material and processing costs have been realized.

The cob-grit media can be used in existing equipment, with few adjustments. Four different grades of cob grits are available.

Manufacturer: Ti-Co Industries, Inc., P. O. Box 185, Tipton, Indiana.

For more data circle **21** on Reader Service Card

★ ★ ★

Fast-Unload Burnishing Barrel

Description: A recently introduced stainless steel wet burnishing barrel is equipped with an integral screening device that permits quick separation of finished work from media.

Operation: After burnishing is completed, the barrel is opened and the perforated screen is placed inside. The screen divides the barrel into two compartments — the lower half contains the mixed work and media; the upper half is empty.

The barrel is given a half-turn; this deposits the contents on the screen. Media drains through the perforations of the screen. The barrel is then reopened and the filled screen taken out.

With this unit, it is not necessary to remove the barrel from the tank of burnishing solution in order to

SPEED UP PRODUCTION WITH DOUBLE-ACTION DRYING

Air-dry as you spin-dry with new, improved New Holland Model 20

KREIDER Centrifugal DRYER

Double-action cuts costs way down—gives smooth, moisture-free surfaces... eliminates scarring and marring frequently responsible for costly "rejects."

Specifications: 1-h. p. motor—220, 440, 550 volts—2- or 3-phase. Spins 75-lb. loads at 825 r.p.m. Quiet U-belt drive. Arc-welded steel plate construction. Weight 490 lbs. Requires minimum floor space. Meets N.E.C. specs. Auxiliary electric or steam heating units available as optional equipment. 3 models.

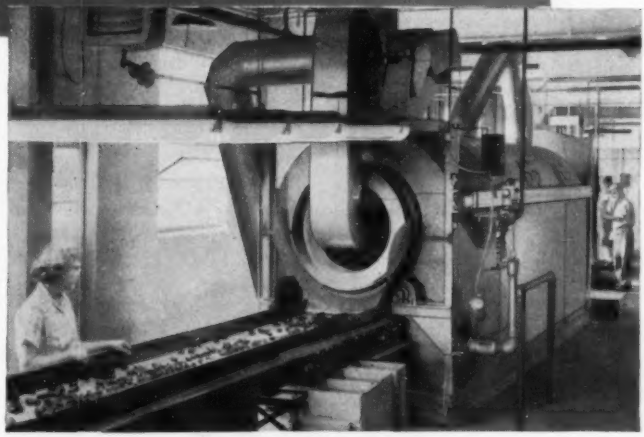
Send for illustrated 4-page folder. Address Dept. 585

NEW HOLLAND MACHINE COMPANY
NEW HOLLAND, PA.

For more data circle 377 on Postpaid Card

AGAIN IT TAKES RANSOHOFF TO FILL THE BILL . . .
AND TWO YEARS OPERATION WITH NO MAINTENANCE

at Clevite Harris Products, Inc., Cleveland



Requiring a finished surface chemically clean and free of all foreign material for molded rubber parts, Clevite Harris relied on the proven ingenuity of Ransohoff engineers to meet this rigid requirement. And, living up to their tradition and reputation since 1916, the Ransohoff team again came through with the answer.

This Ransohoff Drum Type unit, at Clevite Harris, for two years — with no maintenance — has been processing 10-12,000 lbs. of molded rubber parts per eight hour period, including up to eight size changes. These parts are subjected to a sequence of a rinse, wash, rinse and dry. Solutions are delivered into the stainless steel drum by dip cups. Patented drum heads retain solutions in each compartment to insure thorough processing of the work.

Operation is completely automatic . . . a bucket conveyor feeds the work into the machine. The first rinse section is arranged to remove fines from the work. At the unloading end, the work is automatically discharged onto a belt conveyor for final inspection and packaging.

This is another typical example of Ransohoff experience meeting a difficult production requirement. What's your problem? A suggested solution from Ransohoff costs nothing, puts you under no obligation. Submit sample parts, if you wish, for test-processing.

Write today: Ransohoff, Inc., 610 N. Fifth St., Hamilton, Ohio

Ransohoff *The oldest name... the newest ideas*

Designers and Builders of Equipment for the Surface Treatment of Metals

• Washing • Rinsing • Burnishing • Rustproofing • Sawdust Polishing and Drying • De-Scaling • De-Burring • Drying • Pickling • Complete Finishing Systems • Foundry Wet Cleaning Mills • Ultrasonic Cleaning

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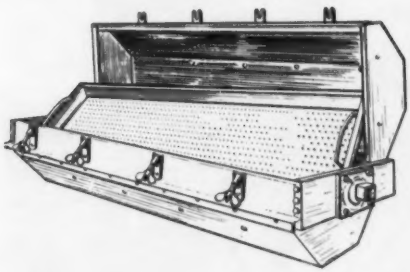


Tumb-L-Matic Stainless Steel Wet-Burnishing Barrel with Integral Screen Separator

separate the finished parts from media. New work can be placed in the barrel immediately after the finished work is taken out.

Applications: Used to brighten metal surfaces and eliminate edge sharpness of small parts such as watch gears, stampings, costume jewelry, electrical components, and screw-machine parts.

Capacities and Components: Stainless steel wet burnishing barrels are available in sizes ranging from eight by nine inches up to 20 by 40 inches. Fractional-horsepower motors supply ample power and are rated for 24-hour continuous operation. Right-angle gearhead single-speed motors are standard, but variable speed units can be specified. A special disc-type dry clutch and chain drive complete the power train components.

Manufacturer: Tumb-L-Matic, Inc., St. Mary's St., Stamford, Conn.

For more data circle **22** on Reader Service Card

★ ★ ★

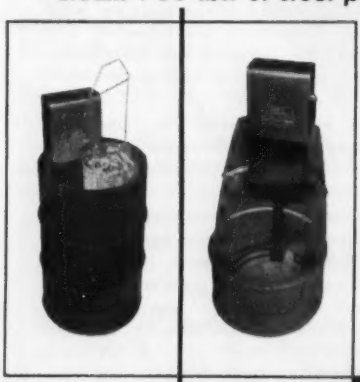
Self-Bonding Nameplate

Description: A self-sticking nameplate which is made of polyester film that is printed, metalized and sealed is useful as a trade mark, nameplate, pattern design or decorative trim.

BAR-L VAPOR DEGREASER

Cleans 700 lbs. of steel per hour!

ONLY $219.50



PORTABLE • INEXPENSIVE
SAFE • EFFICIENT • FAST

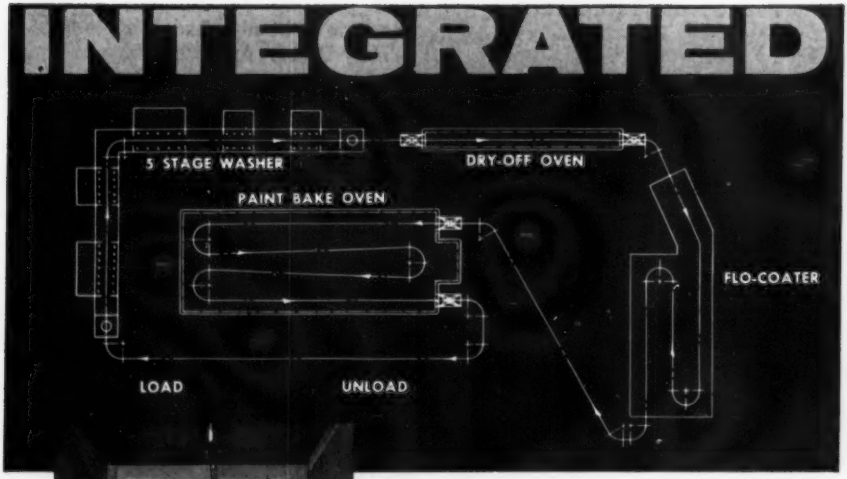
Vapor degreasing can be accomplished at every work location with a MANPRO BAR-L unit. This low priced equipment is rugged, easy to use, and extremely thorough. Operational costs are extra low with BAR-L. Equipped with Vapor Condenser just $30 more. Write or call for FREE literature on the BAR-L and other larger degreasers.

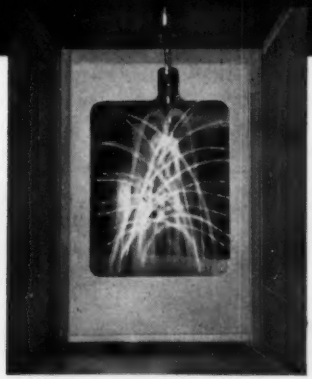
Left: Barrel mounted BAR-L in action. Right: Cutaway showing BAR-L with Vapor Condenser.

MANPRO CORPORATION
1362 HILTON RD. • DETROIT 20, MICH.

For more data circle 379 on Postpaid Card

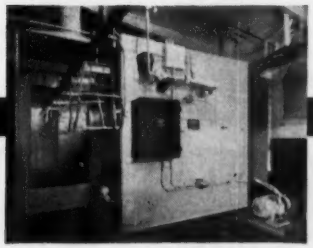
INTEGRATED





Unique lacquer Flo-Coater has wide flare and long flow path to suit the product—supermarket shopping carts and baskets. Compact MOCO installation gives substantial savings in coating materials over other systems.

Air-jet "curtains" at entrance and exit of MOCO baking oven act as a barrier against heat loss. The system is fully equipped with electronic flame failure safeguards.



Finishing Systems– *Cost Controlled* for Modern Production

Integrated Finishing Systems are more than just a plan and installation designed to meet the customer's needs in materials, space and output. At Michigan Oven, engineering a cost-controlled finishing system means equipping for today's demands, and for tomorrow's production.

The lacquer Flo-Coating system illustrated above is a complete and efficient system. Behind its installation lies a thorough study of the plant, of the product, of quality control and initial investment.

This finishing system will pay for itself in a relatively short time. It's engineered for economy, low maintenance and safety—and it will adapt readily to future expansion at low cost.

Send for a free MOCO bulletin showing typical finishing system applications, including products, process and specifications, or write for the name of the MOCO representative nearest you.

F-1

MICHIGAN OVEN COMPANY

MOCO

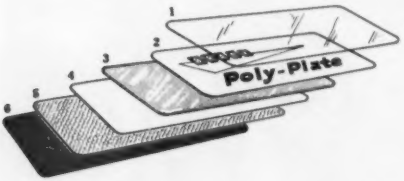
FINISHING EQUIPMENT DEPARTMENT
431 BRAINARD, DETROIT 1, MICHIGAN

Washing Machines • Bonderizing Units • Dry-off Ovens • Dip Tanks • Spray Booths • Flo-coaters • Finishing Ovens • Conveyors

For more data circle 380 on Postpaid Card

The flexible-film Poly-Plates can be used for indoor and outdoor applications. They resist sunlight, salt spray, chemicals, abrasion.

The adhesive-backed nameplates are applied by peeling off the release liner and pressing on the surface where they are to be attached.



Diagrammatic sketch shows how the Brady Poly-Plate is made: 1—polyester film; 2—legend, design and color; 3—metalized coating; 4—seal; 5—self-bonding adhesive; 6—release liner. Total thickness of the Poly-Plate, less than 0.004 inch.

Poly-Plates are available in sizes up to 10 by 15 inches, in three- and five-mil thicknesses and in any color combination desired. Free test samples and descriptive literature are available from the manufacturer.

Manufacturer: W. H. Brady Co., 746 W. Glendale Ave., Milwaukee 9, Wisconsin.

For more data circle **23** on Reader Service Card

★ ★ ★

Strippable Coatings

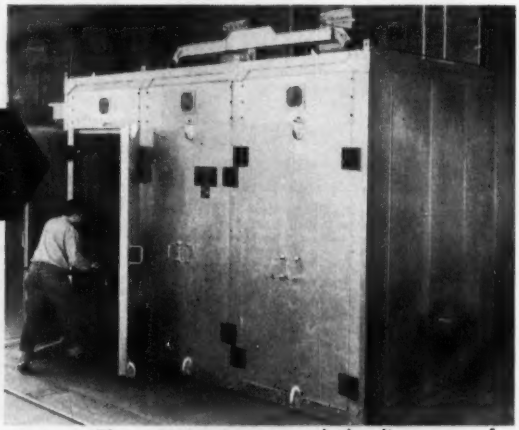
Description: Metalguard S-5119 and S-5219, plastics dissolved in organic solvents, are applied on aluminum and stainless steel architectural metalwork to form a coating that will protect the polished surfaces during shipment and erection. When the protected surface is in place, the coating can be stripped off easily.

For Organic Finishes

ROCKWELL OVENS

- Uniform recirculation drying.
- Positive removal of volatiles.
- Aluminized steel, insulated dual panel construction.
- Complete temperature and safety controls.
- Standard and special batch or conveyor or oven types.

Write for Catalog.



Three-compartment truck loading oven for drying organic finish on metal parts. Each compartment has independent heating and operating controls.

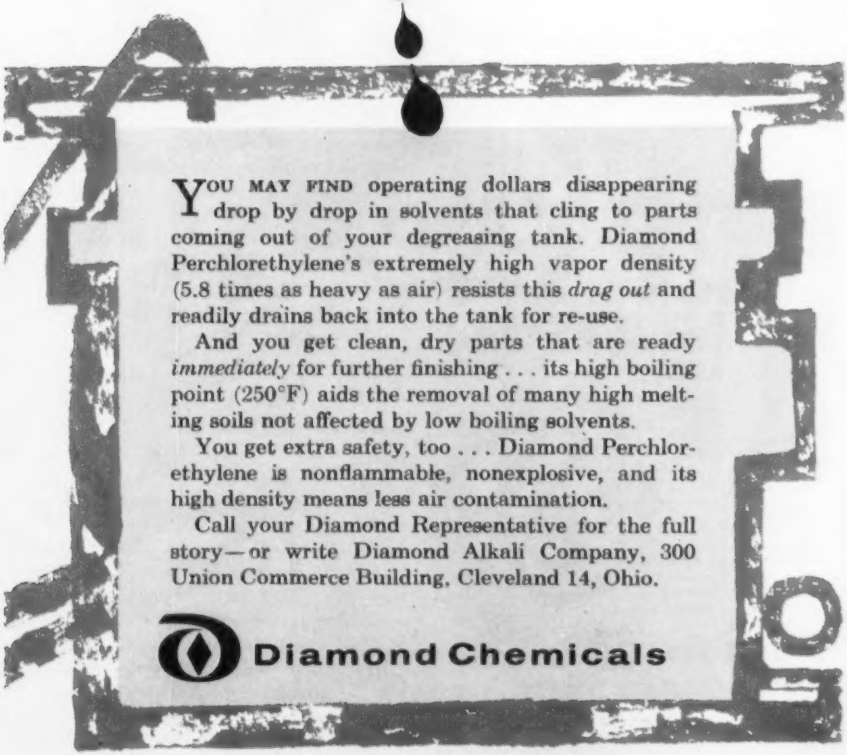
W. S. ROCKWELL COMPANY

2908 Eliot Street • Fairfield, Conn.

For more data circle 381 on Postpaid Card

is your degreasing solvent suffering from

DOLLAR "DRAG OUT" ?



YOU MAY FIND operating dollars disappearing drop by drop in solvents that cling to parts coming out of your degreasing tank. Diamond Perchlorethylene's extremely high vapor density (5.8 times as heavy as air) resists this *drag out* and readily drains back into the tank for re-use.

And you get clean, dry parts that are ready *immediately* for further finishing . . . its high boiling point (250°F) aids the removal of many high melting soils not affected by low boiling solvents.

You get extra safety, too . . . Diamond Perchlorethylene is nonflammable, nonexplosive, and its high density means less air contamination.

Call your Diamond Representative for the full story—or write Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

For more data circle 382 on Postpaid Card

Both coatings air dry to tough, abrasion- and chemical-resistant strippable coatings, that remain easily strippable for a year after application.

Manufacturer: Guard Coatings Corp., 8-05 43rd Ave., Long Island City 1, N. Y.

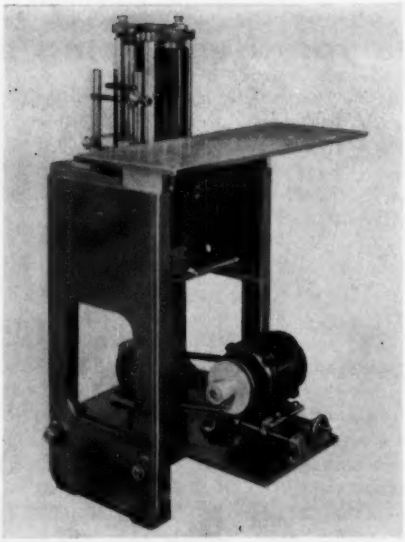
For more data circle **24** on Reader Service Card

★ ★ ★

Grainer for Small Pieces

Description: A gravure-offset graining machine designed for printing on small pieces features a 4-inch-diameter cylinder of one to 15-inch height; variable-speed (25 to 60 f.p.m.); oscillating doctor blades, large inking capacity.

Applications: Continuous printing of edges on tables, desk tops, doors, panels and flat or slightly shaped strips and moldings of any length; graining drawer fronts and small assembled cabinets and chests. Will print on metal, plastics, veneer, wood, hardboard.



Hamant Graining Machine: for small parts

Literature available from the manufacturer.

Manufacturer: Hamant Tool Co., Inc., 500 Warren St., Dayton 9, Ohio.

For more data circle **25** on Reader Service Card

★ ★ ★

Bright Barrel Copper Process

Description: Cop-Brite, a one-material bright barrel copper process.

Properties: A full bright deposit right out of the barrel. High-speed bright copper operates under normal barrel plating conditions with standard solution. Can be used in baths operated at room temperature to 150 deg. F. No cyanide fumes are given off. This is the only brightener required. Its use results in a soft ductile deposit.

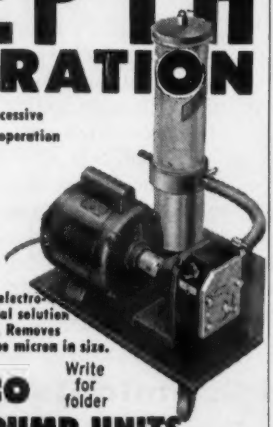
Operation: Used in standard barrel plating facilities, current source 5-12

SURFACE FILTRATION IS NOT ENOUGH!

DEPTH FILTRATION

provides many successive filtrations in ONE operation with
CLARITY
EFFICIENCY
LOW COST

Models equipped with corrosive resistant alloys and materials for every electroplating and industrial solution from pH 0 to pH 14. Removes particles down to one micron in size.



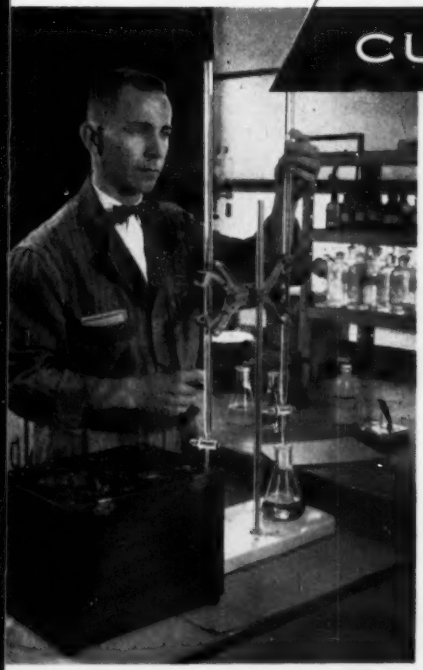
Sethco Write for folder
FILTER PUMP UNITS

Sethco Mfg. Co. 3390 BABYLON TURNPIKE, MERRICK, L. I., NEW YORK

For more data circle 383 on Postpaid Card

consult the..... *Roto-Finish*

CUSTOMER'S MAN

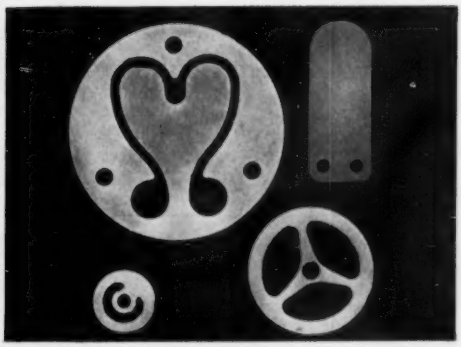


FOR FINISHING PLUS + RESEARCH and TECHNICAL ASSISTANCE

Faced with the problem of cutting down finishing costs with no sacrifice in product quality, more and more production and management men are turning to Roto-Finish for complete finishing *service*.

In the Roto-Finish Laboratory, technicians analyze your problem to determine the process which provides the desired finish at minimum cost. Often, it is necessary *to develop a new compound* to meet a specific need.

Test runs are then made in the Roto-Finish Processing Department under production conditions. If desired, your local Roto-Finish Customer's Man will run these tests in your own plant; so that you can check the results at first hand, results like this . . .



Roto-Finish CASE HISTORY

PART: Refrigeration compressor flapper valves.
MATERIAL: Swedish steel.
OPERATIONS PERFORMED: Deburr. Generate full radii on all edges. Remove stress risers.
RESULT: Fatigue resistance increased 500%.

ROTO FINISH®

Roto-Finish **COMPANY**
3704 Milham Road, Kalamazoo, Michigan
Phone: Fireside 3-5578

FOREIGN REPRESENTATIVES: ARGENTINA—Taller—Buenos Aires ● AUSTRALIA—A. Flavell Ltd.—Cheltenham ● BRAZIL—Commercial E. Industrial de Fornos Werco, Ltd.—Rio de Janeiro ● CANADA—Canadian Hanson & Van Winkle Co., Ltd.—Toronto ● ENGLAND—Roto-Finish Ltd.—Hemel Hempstead ● FRANCE—Societe Roto-Finish—Paris ● GERMANY, AUSTRIA, NORWAY, SWEDEN, SWITZERLAND—Metallgesellschaft A. G.—Frankfurt, a. M.—Germany ● HOLLAND, BELGIUM, LUXEMBURG—N. V. Roto Finish Maatschappij—Delft, Holland ● ITALY—Societa Roto-Finish a R. L.—Milan ● SPAIN—Instituto Electroquimico, S. A.—Barcelona

For more data circle 384 on Postpaid Card

volts. Steel or rubber-lined tanks.

Typical Applications: All types of hardware, novelties and castings — on metals such as steel, zinc, aluminum, brass. Can be used for heat treating.

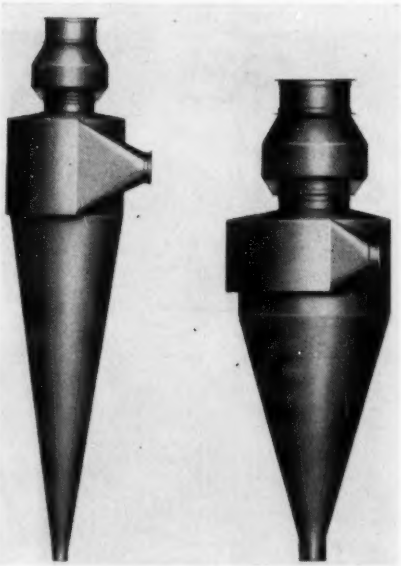
Manufacturer: Jelco Finishing Equipment Corp., 153 East 26th St., New York 10, N. Y.

For more data circle **26** on Reader Service Card

★ ★ ★

Centrifugal Dust Collectors

Description: Series C, Design 3 centrifugal dust collectors remove dust and foreign particles from air by centrifugal precipitation. These air cleaners are designed for use in handling air that contains shavings, sawdust, polishing and buffing dust; collecting dust from any source that creates particles above 325 mesh (400 microns) in size. Will handle dust containing small percentages of particles down to 20 microns.



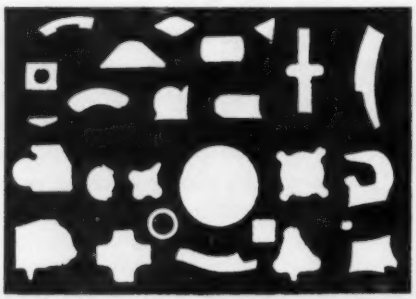
Kirk & Blum Series 3 Dust Collectors

Manufacturer: Kirk & Blum Mfg. Co., 3116 Forrer St., Cincinnati 9, Ohio.

For more data circle **27** on Reader Service Card

★ ★ ★

For more data on any product described or advertised use this postpaid card ⟶



Pre-Cut Masks Speed Finishing

Brady Pre-Cut Masks are self-sticking — go on fast and accurately. Protect from finishing to inspection. Hundreds of shapes and sizes in stock, for paint spraying, baking, tumbling, etc. Specials made to order. Fast delivery. Distributors in 150 cities.

Write for free samples and Bulletin 160-C.

W. H. Brady Co.

746 W. Glendale Ave. • Milwaukee 9, Wis.

For more data circle 385 on Postpaid Card

"GRIPALLOY"

. . . Attractive satin sheen ETCHING PRIMER in black and colors . . . Often used as finish coat . . . Air dries in minutes . . .

. . . Amazing tight adhesion to 25 different metals as reported by a large electrical manufacturer.

. . . Excellent resistance to Salt Spray, Gasoline, and Solvents . . .

TENAX, Newark, N. J.

Lacquers—Enamels

Synthetics—Vinyls

For more data circle 386 on Postpaid Card

JUNE, 1958

1	17	33	49	65	81	97	113	129	145	301-2nd Cov.	330	346	362	378	394	410	426	442
2	18	34	50	66	82	98	114	130	146	302-3rd Cov.	331	347	363	379	395	411	427	443
3	19	35	51	67	83	99	115	131	147	303-4th Cov.	332	348	364	380	396	412	428	444
4	20	36	52	68	84	100	116	132	148	304	317	333	349	365	381	397	413	429	445
5	21	37	53	69	85	101	117	133	149	305	318	334	350	366	382	398	414	430	446
6	22	38	54	70	86	102	118	134	150	306	319	335	351	367	383	399	415	431	447
7	23	39	55	71	87	103	119	135	151	307	320	336	352	368	384	400	416	432	448
8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
10	26	42	58	74	90	106	122	138	154	310	323	339	355	371	387	403	419	435	451
11	27	43	59	75	91	107	123	139	155	311	324	340	356	372	388	404	420	436	452
12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

NAME _____ POSITION _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

PRODUCTS MANUFACTURED _____

Circle numbers (NOT PAGE NUMBERS) to request information

JUNE, 1958

1	17	33	49	65	81	97	113	129	145	301-2nd Cov.	330	346	362	378	394	410	426	442
2	18	34	50	66	82	98	114	130	146	302-3rd Cov.	331	347	363	379	395	411	427	443
3	19	35	51	67	83	99	115	131	147	303-4th Cov.	332	348	364	380	396	412	428	444
4	20	36	52	68	84	100	116	132	148	304	317	333	349	365	381	397	413	429	445
5	21	37	53	69	85	101	117	133	149	305	318	334	350	366	382	398	414	430	446
6	22	38	54	70	86	102	118	134	150	306	319	335	351	367	383	399	415	431	447
7	23	39	55	71	87	103	119	135	151	307	320	336	352	368	384	400	416	432	448
8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
10	26	42	58	74	90	106	122	138	154	310	323	339	355	371	387	403	419	435	451
11	27	43	59	75	91	107	123	139	155	311	324	340	356	372	388	404	420	436	452
12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

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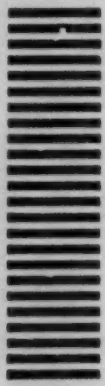

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PRODUCT LITERATURE

For free literature circle corresponding numbers on Postpaid Reader Service Card

43. Conveyorized Finishing Systems
Information on finishing systems for painting articles that are turned out in large quantities. Industrial Ovens, Inc., 13811 Triskett Rd., Cleveland 11, Ohio.

44. Copper Anodes
AMCO Publication 15, entitled "The Copper in Your Plating Anodes" tells about the various types of anodes available to the plating industry, where each type should be used. American Metal Climax, Inc., 61 Broadway, New York 6, New York.

45. Clear Lacquer
Information on Nikolas 2105 Clear Lacquer, for protecting plated finishes from oxidation, marring and discoloration. G. J. Nikolas & Co., Inc., 2880 Washington Blvd., Bellwood, Ill.

46. Strippable Spraybooth Coating
Liquid Envelope No. 49-03 F.X., which is based on non-flammable solvents, sprays on easily, strips off easily. Better Finishes & Coatings, Inc., 276 Doremus Ave., Newark 5, N. J.

47. Save Dirty Solvents
Data on the company's service of reclaiming dirty solvents. Solvents Recovery Service, Inc., 1025 Broad St., Newark 2, New Jersey.

48. Demineralizers
Catalog 127-A illustrates Barnstead's complete line and presents information that can help to reduce waste and improve quality. Barnstead Still & Demineralizer Co., 12 Lanesville Terrace, Boston 31, Mass.

49. Tricks of the Trade
Leaflet entitled "Tanks Full of Experience" tells how to learn tricks of the plating trade by a correspondence course. Joseph B. Kushner Electroplating School, 115 Broad St., Stroudsburg, Pa.

50. Barrel Finishing Machines
Data on the new Baird Poliaction barrel finishing machines. Baird Machine Co., Dept. PF, Stratford, Conn.

51. Chemically Polish Aluminum
Details on Alchemize, a chemical polishing process that provides an economical method of obtaining satin to mirror-bright finishes on any shape of aluminum. Alchemize Corp., 1429 S. Talman Ave., Chicago 8, Ill.

52. Degreasers
Literature describes Blakeslee conveyorized degreasers with patented anti-diffusion chamber that cuts down evaporation of solvent. G. S. Blakeslee & Co., 1844 S. Laramie Ave., Chicago 50, Ill.

53. Heat-Resistant Finish
Data on Sicon Silicone heat resistant finishes, for finishing boilers, heaters, other articles subject to high temperatures. Midland Industrial Finishes Co., Dept. B-6, Waukegan, Ill.

54. High-Temperature Masking
Information on Shurtape, especially designed for use in masking articles that are subject to extreme heat in baking. Shuford Mills, Inc., Hickory, N. C.

55. Spraying Wash Primer
Information on Stantite Spraying Wash Primer, a two-package rust-inhibiting primer that is said to improve the quality of any topcoat, air-dry or bake. Stanley Chemical Co., Dept. D, 1338 Berlin St., East Berlin, Conn.

56. Plating Waste Recovery
Literature on an evaporation process for the recovery of acids and metals used in plating and carried away by dragout and rinses. Industrial Filter & Pump Mfg. Co., 5904 Ogden Ave., Chicago 50, Illinois.

57. Tumbling Abrasive
Form ESA-236 describes Borolon Tumbling Abrasive for barrel finishing. New sizing standards for the aluminum oxide chips are described. More sizes are available, and size is more accurately controlled. Simonds Abrasive Co., Taconey & Fraley Sts., Philadelphia 37, Pa.

58. Airless Automatic Gun
Data sheet tells about features of the AG-100 Automatic Spray Gun, includes drawing to show working parts. Nordson Corp., Amherst, Ohio.

59. Acrylic Coatings
Performance and application information on acrylic-based coatings. The Varnish Products Co., 5204 Harvard Ave., Cleveland, Ohio.

60. Thickness Tester
Description of the Kocour Model 955 electronic plating thickness tester. Kocour Co., 4814 S. St. Louis Ave., Chicago 32, Ill.

Circle numbers on postpaid card opposite page 128 to obtain free literature

61. Spray-Bake Conveyor Machines
Descriptive literature on Capitol high-speed electric spray-bake conveyorized finishing machines. Capitol Machine Co., 36 Balmforth Ave., Danbury, Conn.

62. Electrostatic Painting
Information on the Ransburg No. 2 Process of electrostatic painting. Ransburg Electro-Coating Corp., Indianapolis 7, Indiana.

63. Flat Finisher
Description of Model FF-6 abrasive belt finishing machine. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

64. Corrosion Preventives
Information on Alodine 1200, Lithoform Z and Permadine, conversion coatings that protect various metals from corrosion with or without subsequent painting. American Chemical Paint Co., Ambler 14, Pa.

65. Isophthalic-Based Coatings
Information on the improved properties that can be obtained using organic finishes based on isophthalic acid. Oronite Chemical Co., 200 Bush St., San Francisco 20, Calif.

66. Cleaning Compound
Information on Apex 764, a moderately alkaline composition containing deflocculators and emulsifiers for removing insoluble soils from ferrous metals. Apex Alkali Products Co., Main & Rector Sts., Philadelphia 27, Pa.

67. Automatic Buffing Machine
Information on Packer-Matic automatic buffing machines. The Packer Machine Co., Meriden, Conn.

68. Expandable Contact Wheel
A slotted contact wheel allows the abrasive band or sleeve to be slipped on easily, tightens and holds the abrasive band or sleeve during operation. Data sheet includes recommended speed range. Chicago Rubber Co., Inc., 651 Market St., Waukegan, Ill.

69. Rhodium Plating
Information on rhodium plating solutions that do an excellent job in plating printed circuits. Can be applied in heavy deposits, up to 100 milligrams per square inch. Sigmund Cohn Mfg. Co., Inc., 121 S. Columbus Ave., Mount Vernon, N. Y.

70. Used Equipment
Information on used buffing and polishing machines. J. Holland & Sons, Inc., 485 Keap St., Brooklyn 11, N. Y.

71. Paint Stripper
Information on Kwikstrip DF, a free-rinsing paint stripper that removes tough finishes. Applied by brushing or dipping. London Chemical Co., Inc., 1540 N. 31st Ave., Melrose Park, Ill.

72. Screen Process Dryers
Catalog Sheet No. 1057 describes the Auto-Rack wicket-type dryer, a drying unit for screen process printing. Can be synchronized with the delivery of any automatic press. Advance Process Supply Co., Inc., 1442 W. Kinzie St., Chicago, Ill.

73. Pre-Plated Metals
Literature on pre-plated metals that are ready to use without further finishing procedures. Available in chrome, nickel, copper or brass on steel, zinc, copper, brass and aluminum. American Nickeloid Co., Peru, Ill.

74. Clear Water-Soluble Protective Coating
Data on Irilac No. 1000, a clear protective coating that increases corrosion resistance, does not chemically affect base metal or post treatments. Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore 5, Md.

75. Barrel Finishing Manual
A 50-page manual describes the Supersheen method of barrel finishing; typical installations; process engineering variables; methods for obtaining uniform finishes; media and compounds; many other useful processes and products. Almco, Queen Products, Inc., 84 Marshall St., Albert Lea, Minn.

76. Alloy Anodes for Acid Copper Plating
Technical paper describes results of three-year test of alloy anodes for acid copper plating. American Brass Co., Waterbury 20, Conn.

77. Pearlescent Finishes
Information on air-dry and baking pearlescent finishes. Rona Laboratories, Inc., East 21st and East 22nd Sts., Bayonne 4, New Jersey.

78. Viscosity of Plastisols
A study of the viscosity of plastisols is titled "Effects of Shear Rates, Temperature and Time on the Viscosity of Plastisols." It provides data on the viscosity-temperature characteristics of many plasticizer systems, the viscosity of these systems at low, medium and high shear rates, and the viscosity stability of plastisols after aging. Firestone Plastics Co., Chemical Sales Div., Pottstown, Pa.

79. Measuring Viscosity with a Vibrating Reed
Reprint describes the Ultra-Viscoson, a device for continuous measurement of fluid viscosity. Bendix Aviation Corp., Cincinnati Div., Dept. 390, 3130 Wasson Rd., Cincinnati 8, Ohio.

80. Tack-Cloth Specs
Data sheet gives specifications for tack cloths used to remove dust, lint, sanding particles and so on from products that are to be finished. Bond Chemical Products Co., 2639 N. Clybourn Ave., Chicago 14, Illinois.

81. Self-Stick Nameplates
Bulletin No. 161 describes self-bonding Poly-Plates, metalized polyester films that are adhesive backed, printed with design or insignia that can be used as a nameplate or for identification or trim. W. H. Brady Co., 746 W. Glendale Ave., Milwaukee 9, Wisconsin.

82. Masking Aids
Bulletin No. M-18 contains information on masking discs, pre-cut spray masks, masking tape, plugs, caps, discs, printed-circuit drawing aids. By-Buk Co., 4314 W. Pico Blvd., Los Angeles 19, Calif.

83. Finishing Conveyor
Folder describes and illustrates conveyors that do a good job of taking products through finishing operations. Includes data on the "power-and-free" features of this conveyor, which allow better handling of products in intermediate storage, stage processing, and so on. Chainveyor Corp., 5618 E. Washington Blvd., Los Angeles 22, Calif.

84. Flock-Application Instructions
Brochure and instructions on the application of flock, using new materials and techniques. Cellusuede Products, Inc., 512 N. Madison St., Rockford, Ill.

85. Finger Buffs
Data sheet describes Finger Buffs (Type No. 300) for buffing brass, nickel, aluminum, steel and die castings. Buffs of this type are recommended for use on tube polishing machines as well as other applications. Geo. R. Churchill Co., Inc., Dept. PF-58, Hingham, Mass.

86. Batch-Type Cleaning Machines
Folder describes five Klene-Ezy batch-type machines for cleaning miscellaneous parts. Includes data on small machines as well as large, heavy-duty types. Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

87. Panel-Type Heat Exchangers
Bulletin 258 gives price information on the complete range of sizes of Dean Thermo-Panel Coil heat exchangers. Dean Thermo-Panel Coil Div., Dean Products, Inc., 622 Franklin Ave., Brooklyn 38, N. Y.

88. Automatic Spray Machines
Form No. 1-8010 tells how to select the proper automatic spray finishing machine to do a specific job. Describes features of the DeVilbiss transverse design, includes specifications for various types. DeVilbiss Co., Toledo 1, Ohio.

89. Vapor Degreasing Technical Bulletin
"Vapor Degreasing with Diamond Perchlorethylene" is the title of an interesting 12-page technical bulletin. Discusses essentials of vapor degreasing equipment, scheduling of vapor degreaser cleanouts, suggested operating procedures. Includes tabulation of physical properties of perchlorethylene. Diamond Alkali Co., Chlorinated Products Div., 300 Union Commerce Bldg., Cleveland 14, Ohio.

90. Sandblast Machines
A four-page bulletin illustrates and describes complete line of cabinet-type sandblast machines for cleaning, deburring, surface preparation, stencil finishing. Complete details as to dimensions, construction and operation. Leiman Bros., Inc., 102 Christie St., Newark 5, N. J.

91. Quartz-Lamp Oven Sections
Bulletin 55-104 describes Fostoria quartz-lamp oven sections, tells what they will do, gives specifications. These units are particularly suitable for high-temperature applications. Fostoria Pressed Steel Corp., Dept. 622, Fostoria, Ohio.

92. Laboratory Instruments
A 112-page bulletin describes many testing and control instruments that are useful in the finishing industry: color- and gloss-measuring instruments, viscosity testers, constant-temperature baths, humidity and salt-spray cabinets, film applicators, film thickness gages, hardness, flexibility, abrasion and adhesion testers, lab ovens, drum tools, many others. Gardner Laboratory, Inc., 5521 Landy Lane, Bethesda 14, Md.

93. Electrostatic Spray Equipment
Photographs and descriptive information on Ionic Electrostatic spray equipment. Ionic Electrostatic Corp., 111 Monroe St., Garfield, N. J.

94. Baking and Drying
Bulletin on Chromalox Modular Panels, which can be used as "building blocks" to construct ovens and drying panels. Edwin L. Wiegand Co., 7522 Thomas Blvd., Pittsburgh 8, Pa.

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95. Dry Tumbling Machines
Data folder describes and illustrates single- and double-barrel dry tumbling machines. H. W. Kramer Co., 120-30 Jamaica Ave., Richmond Hill 18, N. Y.

96. Compounds for Barrel Processing
"Permag Compounds for Barrel Processing" is the title of a manual that gives process information on deburring or roughing, coloring and burnishing, descaling, self-rolling and cleaning, rust prevention, neutralizing, other topics. Magnuson Products Corp., 50 Court St., Brooklyn 1, N. Y.

97. Complete Finishing Systems
Catalog No. A-658 describes complete finishing systems for paint, porcelain enamel, lacquer and japan finishing. Describes and illustrates such components as spray booths, baking ovens, dust collectors, cleaning and pickling equipment, flow and dip coaters, many other units of special production equipment. The R. C. Mahon Co., Detroit 34, Mich.

98. Vibrating Degreaser
Advantages of using the Manpro Vibra Degreaser are described in a folder that includes data on the uses, capacity and operational features of this unit. Manpro Corp., 1362 Hilton Rd., Detroit 20, Mich.

99. Copper-Tin Bronze Plating
Folder on M & T Copper-Tin Bronze tells about its use as an undercoat for chromium and as a final decorative finish. As a decorative finish, this plate resembles gold. Metal & Thermit Corp., Rahway, New Jersey.

100. Barrel Finishing Handbook
Booklet entitled "Barrel Finish with Norton Tumblex Abrasives" contains sections on several types of abrasives, together with detailed information about the characteristics and uses of each. Other sections contain valuable data on equipment and compounds, and a glossary of barrel finishing terms. Norton Co., Worcester, Mass.

101. Anodes
Information on copper, nickel and zinc anodes. New Jersey Metals Co., 724 Rockefeller St., Elizabeth 2, N. J.

102. Aluminum Protective Coatings
Data on the Bonderite 700 Series of chemical coatings for aluminum. These coatings are available in green and gold, may be applied by spray or immersion. Parker Rust Proof Co., 2172 E. Milwaukee Ave., Detroit 11, Mich.

103. Glove Selection Guide
Handy pocket folder serves as a guide to selecting the right glove for a particular application. Pioneer Rubber Co., 285 Tiffin Rd., Willard, Ohio.

104. Metal-Surface-Treatment Machines
A 50-page booklet describes and illustrates many types of Ransohoff equipment for the surface treatment of metal: continuous-type drum washers, walking-spray machines, washers for strip metal, parts cleaners, many others. Ransohoff, Inc., 610 North Fifth St., Hamilton, Ohio.

105. Barrel-Finishing Catalog
A 24-page catalog on precision metal finishing by mechanical barrel finishing methods answers basic questions on how to achieve exact tolerances and uniformity of finish in large production runs. Includes descriptions of Roto-Finish barrel finishing equipment. Roto-Finish Co., 3704 Milham Rd., Kalamazoo, Mich.

106. Vacuum Pumps
High-vacuum diffusion and booster diffusion pumps are described in a 12-page bulletin that includes outline drawings, speed curves, tables, and other data to present physical and operating specifications for both mercury and oil pumps with speeds ranging from 10 to 11,000 c.f.m. NRC Equipment Corp., a Subsidiary of National Research Corp., Dept. 23M, Charlemont St., Newton, Mass.

107. Steam Traps
Bulletin No. 257-B describes Sarco Type TD-50 Thermodynamic Steam Traps, which have only one operating part. Sarco Co., Inc., 635 Madison Ave., New York 22, N. Y.

108. Tomorrow's Products Tested Today
Booklet describes company's facilities for corrosion and sunlight testing of various finishes. South Florida Test Service, 4201 N. W. 7th St., Miami, Florida.

109. Paint Spray Equipment
Form 35-22 describes and illustrates a complete line of spray painting equipment: paint pumps, air regulators, paint agitators, compressors, spray guns, paint hoses, many others. Alemite Div., Stewart-Warner Corp., 1850 Diversey Parkway, Chicago 14, Ill.

110. Cold Stripper
Information on a cold stripper that removes photo-resist coating from circuit board in 15-30 seconds. Material is nontoxic, non-flammable, requires no heat or current. Allied Finishing Specialties Co., 2641 W. Grand Ave., Chicago 12, Ill.

111. Room-Temperature Blackening
Data on a non-caustic process for blackening steel that works in as little as 13 seconds, at room temperature. Bob Brownell's, Corner Main and Third, Montezuma, Iowa.

112. Sealing Castings
Information on Cordobond R-203, a sealing and finishing compound for porous castings. Apply by dip, spray, brush, flow coat. Increases corrosion resistance. Available in various colors. Cordo Chemical Corp., 34 Smith St., Norwalk, Conn.

113. Electrocleaner
Technical data sheet on Cowles KW. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

114. Paint Finishing Systems
Bulletin 51C provides sixteen pages on modern ways to achieve better finishes, faster production and smoother metal products handling at lower cost. Despatch Oven Co., 619 S. E. Eighth St., Minneapolis 14, Minn.

115. Cold Degreasing Solvent
Data sheet gives specifications, properties, relative evaporation rates, toxicity ratings, and vapor pressure of chlorinated solvents, particularly Chlorothene, a solvent that is especially suitable for cold cleaning, dip cleaning and bucket cleaning operations. Dow Chemical Co., Midland, Mich.

116. Paint-Stripping Clinic
Information on the company's paint stripping clinic, a laboratory service that quickly returns the answers to tough stripping problems. The DuBois, Co., Inc., 1120 W. Front St., Cincinnati 3, Ohio.

117. Quartz Immersion Heaters
Bulletin describes quartz immersion heaters for heating solutions of acids and alkalis. Glo-Quartz Electric Heater Co., Inc., Willoughby, Ohio.

118. Duplex Nickel Plating Process
Information on the Perflow-Perglow Duplex Bright Nickel plating process. Harshaw Chemical Co., Inc., 1945 E. 97th St., Cleveland 6, Ohio.

119. 57 Metal Treatment Processes
A comprehensive 16-page manual describes in detail 57 chemical processes that take place daily in metal finishing plants. Among the chemical processes discussed in this manual are cleaning, phosphatizing, conversion coating, paint and carbon removing, rust removal and prevention, descaling, electroplating, processing aluminum, others. Nine reference charts. Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

120. Reduce Painting Costs
Brochure contains information about Duracron Thermo-Setting Acrylic Enamel and how it reduces manufacturing costs. Pittsburgh Plate Glass Co., Industrial Finishes Div., 1 Gateway Center, Pittsburgh, Pa.

121. Bright Nickel
Information on Udylite Bright Nickel Process No. 724, a liquid brightener that is said to give faster brightening. Udylite Corp., Detroit 11, Mich.

122. Durable Finish
Information on Kadmoid, a tough, durable finish said to offer peak resistance to salt and other chemicals on products that must resist outdoor exposure. Universal Paint & Varnish, Inc., Box 199, Bedford, Ohio.

123. Protect Steel from Corrosion
Data folder on Oakite Cryscoat HC, a zinc phosphate coating formulated to protect steel from corrosion and prepare it for lasting paint adhesion. Includes complete directions for application. Oakite Products, Inc., 20 Rector St., New York 6, New York.

124. Film Thickness Tester
Bulletin DF gives technical data on the Dermitron non-destructive electronic thickness-measuring instrument, which can be used to check thickness of electrodeposits, organic coatings. Includes data on principle of operation, accessories, other subjects. Unit Process Assemblies, Inc., 61 E. Fourth St., New York 3, N. Y.

125. Custom-Made Buffs
Literature describes custom-designing service for making buffs that fit a specific service requirement. Williamsville Buff Div., Bullard Clark Co., Danielson, Conn.

126. Acid and Caustic Resistant Apparel
1958 Catalog describes and illustrates many types of clothing made especially to resist acids, caustics, other damaging chemicals. Workon, Inc., 253 W. 28th St., New York 1, N. Y.

127. Finishing Chemicals
A graphic presentation of Wyandotte products for metal finishing. Form F 2199. Wyandotte Chemicals Corp., Dept. 3035, Wyandotte, Mich.

128. Protect Highly Polished Surfaces
Information on Neotex, an open-mesh rubber matting that can be used to line any surface where highly polished goods are worked on or in transit. Research Products Corp., Dept. 76, Madison 10, Wisconsin.

Circle numbers on postpaid card opposite page 128 to obtain free literature

129. Ovens
Catalog No. 122, a guide for selecting the proper oven for baking, drying and curing paint, enamel, varnish, ceramics, other materials. W. S. Rockwell Co., 2028 Eliot St., Fairfield, Conn.

130. Bright Silver Instructions
Complete instructions for operating the Silvrex bright silver process. Includes directions for bath make-up, purification of the solution, solution maintenance, plating procedure. Sel-Rex Corporation, Dept. PF, Nutley 10, N. J.

131. Filter for Corrosives
Information on Sethco Model LSIN-20V filter pump, designed to be used for filtering corrosive plating solutions. Sethco Mfg. Co., 2292 Babylon Turnpike, Merrick, L. I., N. Y.

132. Airless Spray
Data sheet describes Model 600 APE-HA HydroAirless spray painting system, a paint application method wherein the paint is atomized by heat and high pressure rather than compressed air. Spee-Flo Manufacturing Corp., 6614 Harrisburg, Houston 11, Texas.

133. Spray Nozzles and Accessories
Catalog No. 24 contains complete data on spray nozzles and accessories. Nozzles are listed in tabular form and complete information is given on pipe sizes, external dimensions, orfice diameters, capacities and pipe angles. Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

134. Sprayable Coatings
Bulletin tells how metals and painted surfaces can be protected during assembly and transit by a plastic coating that is sprayed on, stripped off when product is ready for use. Spraylat Corp., One Park Ave., New York 1, N. Y.

135. Aerosols Unlimited
Brochure tells about custom-loading service for packaging aerosol paints and finishes to be used in touch up of scratches and mars that occur in assembly or delivery. Sprayon Products, Inc., 2077 E. 65th St., Cleveland 3, Ohio.

136. Automatic Metal Finishing
Information on "Little Steve," a compact automatic plating machine that can be adapted to anodizing, dip-painting, flow coating, bright dipping, ultrasonic cleaning, electropolishing, tin immersion processing, other finishing processes. Frederic B. Stevens, Inc., Detroit 16, Mich.

137. Vacuum Metalizing Filaments
Information on high-density tungsten strands, designed to be used in vacuum metalizing. Sylvania Electric Products, Inc., Tungsten and Chemical Div., Towanda, Pa.

138. Stepless Controlled Plating Rectifiers
Technical study reports on the advantages of the Reactron vs. tap-switch or motor-driven variable auto-transformer controls. Ther Electric & Machine Wks., 13A S. Jefferson St., Chicago 6, Ill.

139. Immersion Heater
Descriptive literature on Therm-X immersion heaters, available in quartz and stainless steel with built-in temperature control. N. J. Thermex Co., Inc., 537 Bergen St., Harrison, N. J.

140. Dust Collectors
Information on various types and sizes of dust collectors. Torit Manufacturing Co., 296 Walnut St., St. Paul 2, Minn.

141. Brass Plate
Technical bulletin describes True Brite Brass Solution, available in various formulations, to produce almost any color of brass desired. True Brite Chemical Products Co., Box 31, Oakville, Conn.

142. Metal Strippers
Literature describes various Enstrips formulations, formulated to strip various metallic coatings without harming the basis metal. Enthone, Inc., 442 Elm St., New Haven 11, Conn.

143. Electrostatic Spray
Information on the Ionic Electrostatic Centrifugal Atomizer. Reciprocating and stationary models available. Ionic Electrostatic Corp., 111 Monroe St., Garfield, New Jersey.

144. Conveyorized Paint Finishing
Case histories of how Koch paint finishing systems are being used. Geo. Koch Sons, Inc., Evansville 4, Indiana.

145. Plating Conveyor
Bulletin LS-1 tells how Landahl Chainless Conveyor is able to negotiate both horizontal and vertical turns in a minimum of space. Landahl Chainless Conveyor Co., Subsidiary of American Monorail Co., 13142 Athens Ave., Cleveland 7, Ohio.

146. Ovens
Catalog describes and illustrates various types and sizes of Lanly paint baking ovens. Lanly Co., 2800 Euclid Ave., Cleveland, Ohio.

147. Multi-Color Finish
Information on Poly-Nam multi-colored texture finish. Duralac Chemical Corp., 84 Lister Ave., Newark 5, N. J.

148. Quick-Dry Paint Dip
Data on the Harding Hot-Dip Process, in which the article to be painted is preheated, dipped into paint that has been heated to 160 deg. F. Paint is formulated with chlorinated solvents, which flash off rapidly as soon as the heated article leaves the dip tank. David-Ludwig Co., 14290 Goddard, Detroit 12, Mich.

149. Plating Conveyor
Information on an economical plating conveyor and hoist combination. Solbern Mfg. Corp., Div. of Eisenberg Industrial Contracting Co., 120-13th St., Brooklyn, New York.

150. Low-Voltage Power
Booklet D-103 describes the benefits to be obtained through the use of motor generators. Includes facts on lifetime power dividends. Chandeysson Electric Co., 4082 Bingham Ave., St. Louis 16, Missouri.

151. Plating and Polishing Machinery
Booklet briefly describes history of the company, present facilities, some of the company's products for plating and polishing. Chas. F. L'Hommedieu & Sons Co., 4521 Ogden Ave., Chicago 23, Ill.

152. Integrated Finishing Systems
Bulletin showing typical finishing systems for applying organic coatings includes description of products processed, process used, specifications. Michigan Oven Co., Finishing Equipment Dept., 431 Brainard, Detroit 1, Mich.

153. Water-Emulsion Baking Primer
Information on fire-safe Hydrolex red baking primer, which is said to offer good resistance to acids, alkalies, water, solvents. Industrial Sales Dept. A, Pratt & Lambert, Inc., Buffalo 7, N. Y.

154. Respirator-Mask for Spray Painting
Information on Dupor Chemical Cartridge Respirator No. 10, a mask that fits over the nose and mouth to protect from paint and lacquer fumes, chemical fumes, smoke, and so on. H. S. Cover, P. O. Box 2508, South Bend, Indiana.

Classified Advertising

SALESMEN

Distributors, Jobbers and Manufacturers Agents, with metal finishing contacts preferred to sell and distribute the complete line of McAleer's Polishing and Buffing Compounds in spray, paste or extruded bars. Write or phone.

McALEER MANUFACTURING CORP.
101 S. Waterman • Detroit 17, Michigan
Vinewood 3-5970

SOUTH FLORIDA TEST SERVICE

Testing—Inspection—Research—Engineers

Consultants and specialists in corrosion, weathering and sunlight testing.

4201 N. W. 7th St. • Miami 44, Florida

FOR SALE—Fully equipped, automatic paint line machinery, with all electrical controls, pressure pots, and paint pump lines. Keystone conveyor line 375 ft., operating speed 5 feet per minute. Cincinnati Cleaning & Machinery Co. 3-stage wash line, Chromolux Dry-off oven; 2 DeVilbiss automatic vertical transverse machines set up in DeVilbiss spray booths, 40 ft. Chromolux oven, working capacity 7 ft. high. Now in building, can be removed. Reply: N. Becker, P. O. Box 397, Int'l. Airport Branch, Miami 48, Fla.

ABRASIVES SALES REPRESENTATIVES AND DISTRIBUTORS WANTED

Your proven experience and know-how selling Coated Abrasives and our outstanding German "Hermes" Coated Abrasives and "Horse" Reinforced Resinoid Wheel lines can be the right combination. Many wide territories throughout the country offer real opportunity for high profits. If you have what it takes, our proposition will be just what you are looking for. Box No. 61, c/o Products Finishing, 431 Main St., Cincinnati 2, O.

Space on this page is available for advertising of SERVICES, EMPLOYMENT, USED MACHINERY & EQUIPMENT, ETC.

Sold in inch units, one column wide. Rate: $22.00 per column-inch.

PRODUCTS FINISHING
431 Main St. Cincinnati 2, Ohio

Manufacturers' Representatives, Distributors and Salesmen with industrial contacts to sell complete line of industrial cleaning compounds, paint strippers, phosphates, and rust removers. Reply to Klem Chemicals, Inc., P. O. Box 267, Dearborn, Mich.

finishing clinic

Suggested solutions to problems submitted by readers. Send your problem to our Editorial Staff. There is no charge.

Electroforming

Question: *We are greatly interested in electroforming and believe you or some of your sources of information and equipment may be able to help us. We desire to adapt electroforming to the type of production operation that exists here and in order to do so we must assemble some data.*

We would be grateful to you for answers and/or comments on the following questions: 1) What metals may be utilized and with what success? 2) Thickness of wall attainable? 3) Degree of complexity in part? 4) How feasible, economically, in various metals? 5) Technical ability required in production setup? 6) What literature available to which we might be referred.

We approach this matter from the standpoint of a job plating shop. Your assistance will be deeply appreciated.

I. J. R.

Answer: Many metals have been used in electroforming. The most popular are copper, nickel and iron. Copper and nickel are widely used in the production of electrotypes and printing plates, and iron has found extensive use in producing plates for use by the Treasury Department for printing paper money. Both iron and nickel are used in many other industries.

The wall thickness obtainable depends somewhat upon the complexity of the part, but can be almost as thick as is desired. Usually there is no reason to prepare an electroform thicker than ¼ inch.

The economic feasibility of electroforming and the amount of variation in the shape are problems that require actual trial for correct answers.

With regard to the technical ability required in setting up this type of production, we can advise you that no knowledge other than that required for job plating is necessary. Fundamentally, electroforming is an electroplating process.

With this letter we are forwarding a number of articles published in PRODUCTS FINISHING which cover some of the problems involved in electroforming: "Producing Molds by Electroplating Methods," "Design Factors for Electroforming," "Sulfamate Nickel Plating," "Copper Fluoborate Electrotyping."

We can also refer you to "Principles of Electroplating and Electroforming" by Blum and Hogaboom.

We are also suggesting some companies from whom you will be able to secure additional information on this process.

Where to Buy It

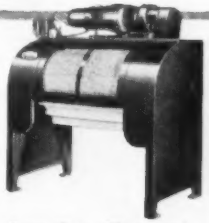
For sources of finishing equipment, materials, processes—
See the PRODUCTS FINISHING DIRECTORY

ALMCO

has the right barrel finishing equipment for you!

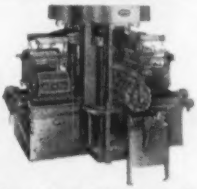
MULTI-COMPARTMENT BARRELS

For a wide variety of parts or small quantity runs where fixtures would be too costly. Ideal for short to medium cycle runs that permit re-use of compounds. These custom designed barrels have automatic forward and reverse, any combination of compartments or doors.



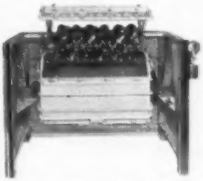
ALMCO'S "ADVANCED DESIGN" SERIES

Thirteen great models in this series! These machines feature a wide range of variable speeds (infinite from 6 to 30 r.p.m.), making possible economical deburring and finishing of the greatest variety of parts.



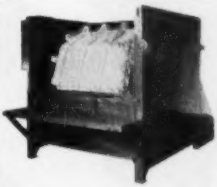
SUB-O-MATIC AUTOMATED SYSTEMS

Almco's exclusive submerged unit is an automatic, "assembly line" system for micro-precision deburring and finishing of small parts in quantity. Saves labor, speeds up processing and flow of high production parts. Slashes compound expense to minimum.



"FIXTURE" TYPE BARRELS

Pioneered by Almco for processing large and intricate parts. Custom designed fixtures hold parts securely, prevent part-on-part impingement and allow abrasive action to reach all surfaces, cavities, slots, etc. Automatic forward and reverse controls.



CUSTOM-DESIGNED BARRELS

Almco designs and manufactures special barrels of all types for problems where standard equipment cannot be effectively used. These range from the smallest type to the largest fixture barrel such as the 60" diameter x 60" length barrel shown above. Special large triple flat doors are also available.

SMALLER MACHINES

Twin barrel machines manufactured by Almco are the standard of the industry for shops processing small lots of parts and for companies with large lots of small parts. Also ideal for sample processing, barrel finishing research and development work, and as auxiliary equipment.

Send in Your Sample Parts

Your sample parts processed without obligation in a modern Almco test lab! Simply write on letterhead for address of nearest Almco lab or send parts direct to Albert Lea, Minn. Enclose specifications desired. Complete free report includes recommendation. 52 PAGE BARREL FINISHING HANDBOOK SENT ON REQUEST.

ALMCO

QUEEN PRODUCTS, INC.

86 Marshall Street • Albert Lea, Minnesota

Subsidiary of KING-SEELEY Corporation

Sales Engineering Offices in Chicago, Detroit, Los Angeles, Newark, New Haven and Philadelphia

IN ENGLAND: Almco Division of Great Britain, Ltd., Bury Mead Works, Hitchin, Herts, England

For more data circle 404 on Postpaid Card

At right, the 76-pound electroformed copper mold in which the beautifully detailed, 28" vinyl plastisol hobbyhorses are cast. Plated Moulds, Inc., is now working on molds weighing up to 250 pounds.

Shape of things to Come—in Copper

Plated Moulds, Inc., finds even heavy, intricate molds are plated faster—deposits are smoother, denser, more uniform—with "Plus-4" (Phosphorized Copper) Anodes

"Plus-4"® Copper Anodes have helped Plated Moulds, Inc., Yonkers, N. Y., open up new areas of business in electroformed copper molds for the mass production of intricately shaped products in vinyl plastisols.

A leader in the production of copper molds for dolls and toys, Plated Moulds also pioneered in making the molds for plastic footwear. About three years ago, the company tried "Plus-4" Anodes in its tanks with these results:

1. Deposits were uniform, with excellent density. They had experienced some porosity with ordinary anodes.

2. There were far fewer nodules. This was particularly important in building up shells as thick as ¼".

3. They could plate faster, using higher current densities.

4. Efficiency in copper use was higher because the anodes corroded more uniformly.

5. Tank maintenance was reduced. There was less sulfate—no sludge.

These advantages made it practical and economical to try larger, heavier molds. The hobbyhorse mold illustrated is one result. And Plated Moulds is moving out into the commercial and industrial fields with molds for motorcycle and bicycle seats, automotive assemblies, display models.

Write for information on how you can obtain a test quantity to supply one tank. Address: The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 58134

ANACONDA®

"PLUS-4" ANODES Phosphorized Copper

Made by The American Brass Company

For more data circle 387 on Postpaid Card

News of the Finishing Industry

✔company news
✔new positions
✔new plants
✔meetings

COMPANIES

Claremont Waste Manufacturing Co., Claremont, New Hampshire, has changed its name to **Claremont Flock Corp.** The company converts natural and synthetic fibers into flock, used as decorative and utilitarian finishes.

★ ★ ★

MacDermid Western Incorporated, a wholly owned subsidiary of **MacDermid Incorporated,** Waterbury, Connecticut manufacturer of metal cleaning, plating and finishing chemicals, has been absorbed by the parent company.

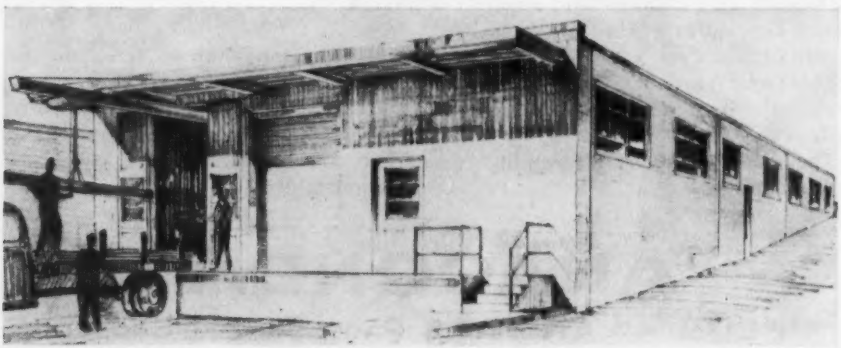
All business of the Ferndale, Michigan subsidiary will be taken over by MacDermid Incorporated. All transactions will be handled by the Waterbury, Connecticut, office.

NEW PLANTS

Sarco Manufacturing Corp., Bethlehem, Pa., and **Sarco Co., Inc.,** New York City, will construct a new factory wing in Bethlehem. The new structure will increase by 50 per cent the company's facilities for manufacture of Thermo-Dynamic Steam Traps. The building will be completed in mid summer.

★ ★ ★

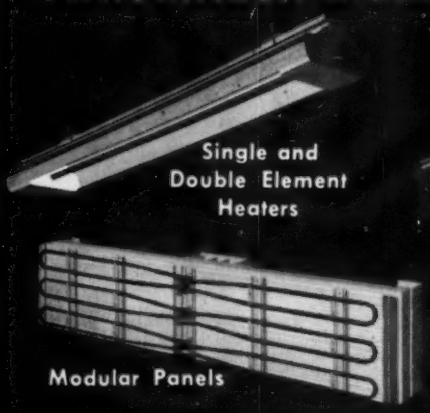
Towle Industrial Corporation, Philadelphia, has been appointed sales representative for **Schauer Manufacturing Corporation,** Cincinnati, Ohio. Towle will sell Schauer lathes in eastern Pennsylvania, southern New Jersey, Maryland and Delaware. **Joseph C. Towle** is president and **D. H. Bell** vice president of the organization.



Architect's rendering of Sarco's new facilities for making steam traps in Bethlehem, Pa.

FAST uniform heating ... dialed to your exact need

CHROMALOX *Electric Far-Infrared*



Isn't this the heat you need?

- Fast . . . up to 75% faster than convection
- Uniform . . . no over- or undercuring
- Color-blind . . . absorbed almost equally by all colors
- Clean—safe . . . no fumes, no flames, no glare
- Accurately controlled . . . with infinite number of settings to match different jobs
- Unbreakable, all-metal, maintenance-free
- Easy and economical to put on the job

Chromalox Electric Far-Infrared is the answer

2616

FREE BULLETINS for each type heater. Tell us your needs and we'll give you specific recommendations. Write today.

CHROMALOX
Electric Heat
INDUSTRIAL • COMMERCIAL • RESIDENTIAL

EDWIN L. WIEGAND COMPANY
7522 THOMAS BOULEVARD, PITTSBURGH 8, PENNA.

For more data circle 388 on Postpaid Card

The Electro Minerals Division of **The Carborundum Company** has opened a Product Development Laboratory.

The Electro Minerals Division manufactures crude silicon carbide and aluminum oxide, abrasive grains and powders, tumbling nuggets, boron carbide, other carbides and oxides.

The new laboratory was built to meet the increasing demand for technical information. It contains a wide variety of laboratory equipment for product development and testing, provides pilot plant facilities for developing manufacturing processes.

The new facility is under the overall direction of **J. J. Forrester, Jr.,** manager, Product Engineering Branch, with **M. F. Kiachif,** manager of the Product Development Department, in direct charge.

★ ★ ★

Sharpe Manufacturing Company has been appointed western distributor for **Therm-O-Spray** paint heaters.

TRUE BRITE BRASS SOLUTION

A foolproof solution which has been in use for over 6 years in light and heavy production.

- Ready To Use—Just Add Water
- No Variance in Color
- Trouble-Free—Little Supervision Needed
- Low Cost—Additions only once a day

Available in a variety of colors. Will match your sample.

Write for technical bulletin and prices.

TRUE BRITE CHEMICAL PRODUCTS CO.
Box 31, Oakville, Conn.

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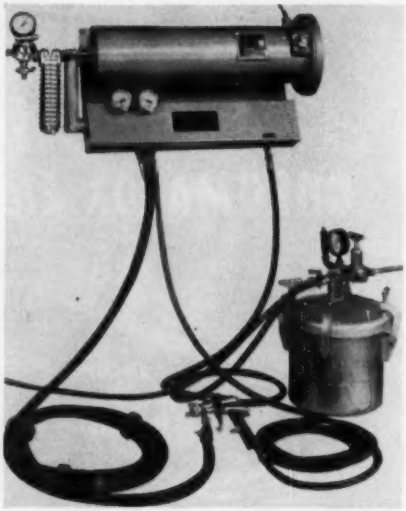

Therm-O-Spray Paint Heater: uses hot air

The Therm-O-Spray uses hot air to raise paint temperature.

As an adjunct to the Therm-O-Spray, Sharpe Manufacturing has developed a multi-jet nozzle, designated as No. 25, designed to provide better atomization in spraying heated materials.

Information and literature on the Therm-O-Spray and No. 25 multi-jet nozzle are available from Sharpe Manufacturing Company, 1224 Wall St., Los Angeles 15, Calif.

★ ★ ★

The corporate name of the **Manufacturers Processing Company** has been changed to **Manpro Corporation.** The Detroit firm made the change to identify itself more closely with its products, which have been sold for many years under the Manpro trade name.

★ ★ ★

Logo, Inc., formerly a wholly owned subsidiary, has been dissolved and merged into its parent, the **Bee Chemical Company.**

M. A. Self, formerly president of

both firms, will serve as president and general manager of the Bee Chemical Company. **R. E. Dunning** has been elected to the position of vice president of manufacturing of the merged operation, a position he previously held with Logo.

★ ★ ★

As a part of a general expansion program aimed at providing a more complete service and broader, more comprehensive product development for the metal finishing industry, **Allied Research Products, Inc.,** Baltimore, and **Wagner Brothers, Inc.,** Detroit, have merged their operations. This move was accomplished by Allied's acquiring the metal finishing operational assets and products of Wagner Brothers. Included in the transaction was the sale of some of Allied's common stock to Wagner Brothers, Inc. Wagner Brothers, Inc. is now divorced from the metal finishing field but will continue to operate its subsidiary, Automatic Molding Machine Co., Inc.

Through the merged operations, Allied Research now offers the metalworking industry a complete line of chemical and electrochemical processes, anodes, rectifiers, automatic equipment and supplies for metal finishing. In addition, research and development facilities are increased and the field sales and service organization strengthened. In jointly announcing the merged operations, **H. C. Irvin,** president of Allied Research, and **J. R. Wagner,** president of Wagner Brothers, Inc., and now administrative assistant to Mr. Irvin, emphasized that the key personnel of both companies will continue in the same general functions to assure uninterrupted and improved service on all products.

Allied's headquarters operations are in Baltimore at 4004 E. Monument St., while branch administrative offices have been established at 400 Midland Ave., Detroit. Other facilities provided by the combine include manufacturing in one plant in Baltimore and three in Detroit with research and pilot plant facilities in both cities. Sales representatives and distributors cover the U. S. and Canada, with district sales headquarters in Baltimore, Chicago, Detroit and Bridgeport. Warehouses are located in leading industrial centers from coast to coast. The company also has licensees on the West Coast and in Europe and exports direct to other countries not yet covered by license arrangements.

Allied Research Products, Inc., stems from work which was begun in 1941 by the Rheem Manufacturing Co., resulting in a totally-owned research and development subsidiary known as Rheem Research Products, Inc.

This company became Allied Research Products, Inc., in 1947, when the Rheem interest was purchased. In 1951, two subsidiary corporations were formed, Allied Research Sales Corporation as a national marketing organization, and Allied Metal Finishing Corporation as a metal finishing job shop, the largest on the East Coast south of Philadelphia. In the years since 1947, Allied Research has grown rapidly and today is a leading supplier of chromate conversion coatings.

Harry C. Irvin (right), president of Allied Research Products, Inc., welcomes Joe Wagner into the Allied organization, and congratulates him on becoming administrative assistant to the president of the merged company.

These are used for protection or decorative finishing or paint base on nonferrous metals including zinc, cadmium, aluminum, magnesium, copper, brass, bronze and silver. A most recent development was a water soluble polymer incorporating corrosion inhibitors that provides a clear protective coating for all metals. In addition, the company manufactures and markets a line of electroplating brighteners.

Wagner Brothers, Inc., has been active in supplies, chemicals and equipment for the metal finishing industry. Wagner's developmental efforts have been mainly directed toward electrochemical processes and mechanical methods of materials handling for chemical and electrochemical processing. Wagner has also developed methods for casting and marketing various metallic anodes for electroplating processes.

★ ★ ★

More than a dozen industrial finishes representatives of **The Lowe Brothers Company** gathered at the firm's Dayton, Ohio, headquarters recently for sales conferences.

Purpose of the meetings, said **E. F. Teyber,** industrial division manager, was to introduce Nobility, Sheltercote, Armadello, Eponal and Zinoxide. All are new industrial finishes and protective coatings.

Theme for the sessions was "Finishes for the Future."

J. B. Woods, sales manager, and **R. A. Drerup,** office manager, helped Mr. Teyber conduct the meetings.

★ ★ ★

The Third National Coated Abrasive Machinery Show will be held at the **Behr-Manning Company** plant in Troy, New York, June 10-13.

More than 150 of the newest coated abrasive machines built by leading manufacturers will be in operation during the show.

The machinery manufacturers' engineers, designers and sales people and representatives of coated abrasive manufacturers will be on hand to answer questions and discuss problems.

Just off the show floor, a course on abrasive grinding and polishing will be conducted by experienced product engineers, who will explain and demonstrate the theory and application of coated abrasives.

Polishing and buffing equipment and accessories to be displayed and the manufacturers who will have such products at the show are summarized in the following list:

AUTOMATIC POLISHING MACHINES

Acme Manufacturing Co., Detroit, Mich.; Divine Brothers Co., Utica, N. Y.; Hammond Machinery Builders, Inc., Kalamazoo, Mich.

BACKSTAND IDLERS

Fenlind Engineering Co., Rockford, Ill.; Rockwell Manufacturing Co., Delta Power Tool Div., Pittsburgh, Pa.; Divine Brothers Co., Utica, N. Y.; Hammond Machinery Builders, Inc., Kalamazoo, Mich.; Standard Electrical Tool Co., Cincinnati, Ohio.

BENCH POLISHERS

Hammond Machinery Builders, Inc., Kalamazoo, Mich.; Engelberg-Huller Co., Inc., Syracuse, N. Y.; Rockwell

Reduce Finishing Cost

INCREASE YOUR PRODUCTION...

OVERLAPPING – HEAT RESISTANT
KWIKY-DOTS®
MASKING DISCS
A raised edge is automatically provided on each disc for easy grasping. Connected strings of several discs may be removed for fast application. Stock sizes—⅛" up.
Extra Narrow Masking Tape
As narrow as 1/32" and up in full 60-yard rolls.
Pre-Cut Spray Masks
Die-Cut Masks, Caps and Plugs
Made to specifications
Send for literature
Dealers' inquiries invited
IMMEDIATE DELIVERY!

BY-BUK COMPANY

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Manufacturing Co., Delta Power Tool Div., Pittsburgh, Pa.; Ryman Engineering Co., Ellwood City, Pa.

CENTERLESS POLISHING MACHINES

Stephen Bader & Co., Valley Falls, N. Y.; Engelberg-Huller Co., Inc., Syracuse, N. Y.; Production Machine Co., Greenfield, Mass.

CONVEYORIZED POLISHING MACHINES

Divine Brothers Co., Utica, N. Y.; Engelberg-Huller Co., Inc., Syracuse, N. Y.; Hammond Machinery Builders, Inc., Kalamazoo, Mich.

DISC POLISHING MACHINES

Rockwell Manufacturing Co., Delta Power Tool Div., Pittsburgh, Pa.; Jarvis Corp., Middletown, Conn.; R. G. Haskins Co., Chicago, Ill.

DRUM SANDERS

Beach Manufacturing Co., Montrose, Pa.; Curtin-Hebert Co., Inc., Gloversville, N. Y.

DUST COLLECTOR

Rockwell Manufacturing Co., Delta Power Tool Div., Pittsburgh, Pa.

EXHAUST SYSTEMS

American Air Filter Co., Inc., Louisville, Ky.; Hammond Machinery Builders, Inc., Kalamazoo, Mich.; Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

EXTRUSION POLISHERS

Engelberg-Huller Co., Inc., Syracuse, N. Y.; Hammond Machinery Builders, Inc., Kalamazoo, Mich.; Murray-Way Corp., Birmingham, Mich.

MISCELLANEOUS

Acme Manufacturing Co., Detroit, Mich. (Roller Feed Unit); Behr-Manning Co., Troy, N. Y. (Model Abrasive Belt Storage Room); Union Tool Corp., Warsaw, Indiana (Union Vacuum Lift).

OFFHAND POLISHERS

Stephen Bader & Co., Valley Falls, N. Y.; Divine Brothers Co., Utica, N. Y.; Hammond Machinery Builders, Inc., Kalamazoo, Mich.; Standard Electrical Tool Co., Cincinnati, Ohio.

PEDESTAL POLISHERS

Bush Manufacturing Co., Clawson, Mich.; Grinding & Polishing Machinery Corp., Indianapolis, Indiana; Hammond Machinery Builders, Inc., Kalamazoo, Mich.; Rockwell Manufacturing Co., Delta Power Tool Div., Pittsburgh, Pa.

PORTABLE TOOLS

Black & Decker Manufacturing Co., Towson, Md.; Brunswick Machine Tool Corp., Eagle Mills, Troy, N. Y.; Cleco Air Tools, Houston, Texas; Mall Tool Co., Chicago, Ill.; National-Detroit Corp., Rockford, Ill.; Porter-Cable Machine Co., Syracuse, N. Y.; Rotor Tool Co., Cleveland, Ohio; Skil Corporation, Chicago, Ill.; Stanley Electric Tools, New Britain, Conn.; Thor Power Tool, Aurora, Ill.; Watervliet Tool Co., Albany, N. Y.

ROLL POLISHER

Hammond Machinery Builders, Inc., Kalamazoo, Mich.

SHEET, STRIP, COIL AND BAR POLISHERS

Engelberg-Huller Co., Inc., Syracuse, N. Y.; J. M. Nash Co., Milwaukee, Wis.; Oakley Co., Inc., Bristol, Tenn.; Sherrill Machine Co., Statesville, N. C.; Union Tool Corp., Warsaw, Indiana; Yates-American Machine Co., Beloit, Wisconsin.

Display card being distributed by Bacon Felt Company among jobbers for Paramount felt products features an assortment of felt bobs in a bench-top box.

SWING-FRAME POLISHERS
Stephen Bader & Co., Valley Falls, N. Y.; Fox Grinders, Inc., Pittsburgh, Pa.; Grinding & Polishing Machinery Corp., Indianapolis, Indiana.

TONGUE-YOKE SANDERS
Bush Manufacturing Co., Clawson, Mich.; Curtin-Hebert Co., Inc., Gloversville, N. Y.; Grinding & Polishing Machinery Corp., Indianapolis, Indiana; Hammond Machinery Builders, Inc., Kalamazoo, Mich.

TUBE POLISHERS
Acme Manufacturing Co., Inc., Detroit, Mich.; Hammond Machinery Builders, Inc., Kalamazoo, Mich.; Kearsarge Engineering Corp., New London, N. H.; Murray-Way Corp., Birmingham, Mich.

WHEELS, CONTACT
Chicago Rubber Co., Inc., Waukegan, Ill.; F. L. & J. C. Codman Co., Rockland, Mass.; Formax Manufacturing Corp., Detroit, Mich.; Nu-Matic Grinders, Inc., Cleveland, Ohio.

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The Varnish Products Co.
5204 Harvard Avenue
Cleveland, Ohio

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Speedier, more economical methods of applying industrial coatings were recently demonstrated for sales representatives and distributors of **Truscon Laboratories, Industrial Maintenance Division, Devoe & Raynolds Co., Inc.,** by the **DeVilbiss Company** in Toledo, Ohio.

DeVilbiss representative demonstrates spray painting equipment to salesmen and distributors of Truscon Laboratories, Industrial Maintenance Div., Devoe & Raynolds Co., Inc.

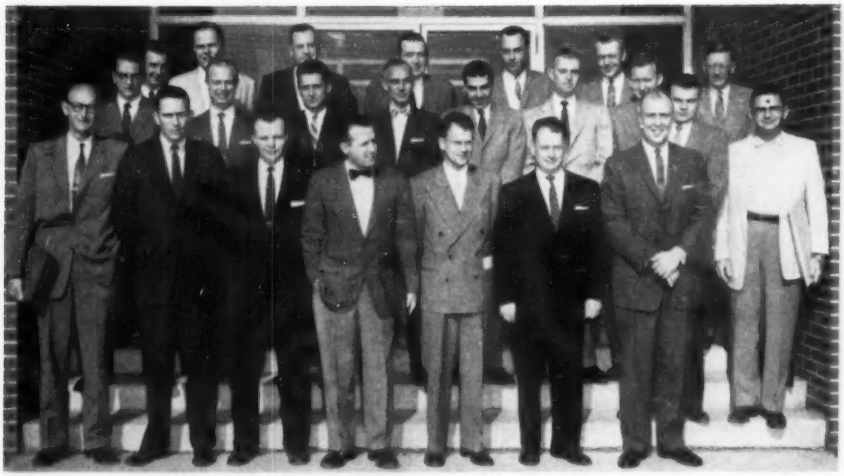
The demonstration, part of a two-day meeting, showed modern spray equipment, including the hot-spray process, in action. Methods of spraying all of the company's industrial paints were demonstrated.

★ ★ ★

Eight Dow solvents field technical representatives recently attended a week-long solvents conference at **Dow Chemicals'** headquarters in Midland, Mich., to discuss new product developments and solvent uses.

W. U. Seiler, solvents field service supervisor, was chairman of the conference, first such meeting to be held in Midland since solvent sales became a section of the Chlor-Alkali Sales Department recently.

Speakers at the conference included W. R. Dixon, Dow general sales manager; K. M. Wildes, Chlor-Alkali sales manager; and Frank W. Larabee, Solvents Section sales manager.



Dow solvents field salesmen present at recent solvents conference. Front row, left to right: Don Huff, San Francisco Sales; D. G. Arteberry, St. Louis Sales; W. J. Keenan, Midland Sales; J. D. Themins, Detroit Sales; W. H. Colgrove, Chicago Sales; D. L. McEwen, Boston Sales; second row, A. J. Pastor, Technical Service and Development; T. J. Christiansen, Industrial Solvents Supervisor; G. G. Taddei, Chemicals Merchandising; J. A. Skaggs, Texas Production; J. A. Masmanian, New York Sales; C. J. Giles, Cleveland Sales; R. J. Clark, San Francisco Sales; A. E. Schober, Technical Service and Development; L. S. McDonald, Texas Production; back row: C. C. Castle, Drycleaning Supervisor; D. H. MacDonald, Midland Technical Sales; J. D. Kerr, Technical Service and Development; F. W. Larabee, Solvents Section manager; J. W. Woods, Los Angeles Sales; W. U. Seiler, Field Service Supervisor; and J. L. Sherk, Chemicals Merchandising manager of the company.

NEW POSITIONS

Edward D. Hanagan has been appointed controller of **Oakite Products, Inc.**, manufacturer of industrial cleaning and metal treating materials.

Three **Minnesota Mining & Manufacturing Co.** executives — **Maynard H. Patterson, Robert W. Mueller** and **Lyle H. Fisher** — have been elected vice presidents.

Harold F. Larson has been elected assistant treasurer of the company.

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Robert F. Morton

Robert F. Morton has been promoted to northeastern regional sales manager of **Apex Alkali Products Co.**, Philadelphia manufacturer of a complete line of metal cleaners for the finishing industry.

★ ★ ★

Dr. Joseph V. Petrocelli has been appointed head of the Electrochemical Section of the **International Nickel Company's** Research Laboratory at Bayonne, New Jersey, according to an announcement by Dr. W. A. Wesley, manager of the laboratory. Formerly director of research and development for The Patent Button Company, Waterbury, Connecticut, Dr. Petrocelli joined the Bayonne laboratory staff on August 1, 1957, as a research electrochemist.

As head of the International Nickel Electrochemical Section of the Research Laboratory, Dr. Petrocelli directs activities in the principal fields of study such as improvement of existing processes of nickel plating and plating of nickel alloys, the development of new plating processes, study of the mechanism of corrosion of electrodeposits, study of the microstructure of electrodeposits, and development of new engineering applications for chemically reduced and electrodeposited coatings of nickel and nickel alloys.

★ ★ ★

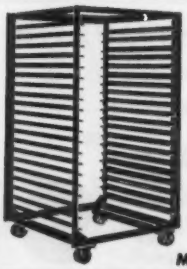
M. A. Tardiff has been appointed manager of general equipment sales for **Hanson-Van Winkle-Munning Company.**

Before joining H-VW-M, Mr. Tardiff was a partner in Vern Bush Co., a steel erection company. He has had extensive experience in the plating field. He was head chemist in plating at Keeler Brass, Grand Rapids, for eight years.

William W. Roche

M. A. Tardiff

William W. Roche has been elected to the Board of Directors of **Binks Manufacturing Company,** Chicago manufacturer of spray painting equipment and water cooling towers.



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DEPT. H

MECHANIC ST. & ERIE R.R., PORT JERVIS, N. Y.

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RECEIVER'S SALE

Notice is hereby given that the undersigned, Robert C. Watson, Receiver of Metal Trim Company, Inc., appointed as such Receiver by the Randolph Circuit Court, Randolph County, Indiana, in Civil Cause No. 9315, entitled Walter H. Payne vs. Metal Trim Company, Inc., pursuant to an order of said Court will offer for sale at public sale on

SATURDAY, JUNE 28, 1958
AT 10:00 A.M., E.S.T.

at the plant of Metal Trim Company, Inc., 828 North Main Street, Winchester, Indiana, all of the machinery, equipment, supplies, real estate and inventory of said corporation.

The machinery, equipment and supplies to be sold consist of all that is necessary for the stamping, buffing and copper, nickel and gold plating and painting of trim and hardware parts for appliances and for automotive parts and trim.

The real estate to be sold is described as follows, to-wit:

"Beginning at a point in the middle of the Winchester and Deerfield Pike, now U. S. Highway No. 27, 758.1 feet north of the center of Fifth Street in the City of Winchester, Indiana, running thence east 180 feet, thence north 160 feet, thence west 180 feet, thence south 160 feet to the place of beginning, being a part of the Southeast Quarter of Section 17, Township 20 North, Range 14 East. Also,

"Commencing 180 feet east and 915.6 feet north of the intersection of the center line of Main Street and Fifth Street in the City of Winchester, Indiana, for a place of beginning, and running thence north 62.5 feet, thence east 141 feet, thence south 218.75 feet, thence west 141 feet, thence north 156.25 feet to the place of beginning, the same being lots numbered 25, 26, 27 and the north one-half of lot numbered 28 on an unrecorded plat of lands of J. E. Baxter in the City of Winchester, Indiana, and estimated to contain 3/4 acre, more or less.

(The improvement on said real estate is a single story building of 12,500 sq. feet under roof of steel and glazed tile construction and in excellent condition.)

TERMS — CASH

Sale to be made for not less than 2/3 of the full appraised value if sold at public auction; if not sold at public auction Receiver will hold the same for sale at private sale from day to day thereafter until sold and for cash and for not less than the full appraised value.

A complete list of the machinery, equipment, inventory and supplies will be furnished upon receipt of request for the same addressed to the undersigned Receiver.

ROBERT C. WATSON, Receiver
c/o Metal Trim Company, Inc.
Winchester, Indiana

ROBERT C. OLIVER, JOHN T. COOK } Attorneys for Receiver

FAYE S. FISHER
Auctioneer

Francis X. Maher has been appointed district sales manager for **NRC Equipment Corp.**, Newton, Mass. Succeeding **Harry D. Stone**, who was recently promoted to sales manager of the firm, Mr. Maher will direct sales and engineering service activities in Ohio and neighboring states from offices in Cleveland.

★ ★ ★

The appointment of **Dr. Francis Leslie Scott** to the post of project leader in **Pennsalt Chemicals Corporation's** Technical Division has been announced by Dr. George McCoy, manager of Pennsalt Research and Development.

★ ★ ★

Appointment of **Robert N. Wolfe** as general manufacturing manager, adhesives, coatings and sealers division, has been announced by **Minnesota Mining & Manufacturing Co.**

At the same time, 3M announced the appointment of **Walter C. O'Leary** as technical director for the division, reporting directly to Mr. Wolfe, whose new responsibilities include research, product development, technical service, field service and manufacturing development—as well as the direction of all division manufacturing plants.

★ ★ ★

W. S. Rockwell Company, Fairfield, Conn., manufacturer of industrial valves, furnaces and ovens, has announced that **Stanley G. Oppenheim** has been named vice-president and general manager of the company.

Prior to joining the company, Mr. Oppenheim was manager of the gauge products division of Norden-Ketay Co.

W. R. Wardrop

S. G. Oppenheim

William R. Wardrop has been appointed sales engineering representative for BFC Protective Coatings in the upper New York State area with

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- **COB GRITS (Blasting)**
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Use In Blasting, Tumbling Machine To Remove Burrs, Plastic Flash; Molding Or Core Sand. Will Replace Steel Shot At Much Lower Cost.

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"Words of praise cannot describe the true value of your course. Wonderful for ready reference when needed quickly on the job," writes plater Aubrey Holt. You'll sing words of praise too, about this unique ELECTROPLATING KNOW HOW course, once you enroll. Write Dr. Joseph B. Kushner, Electroplating School, 115 Broad St., Stroudsburg 10F, Pa.

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headquarters at 150 Avalon Drive, Snyder, N. Y., according to an announcement by **Better Finishes & Coatings, Inc.,** 268 Doremus Ave., Newark 5, N. J.

★ ★ ★

Turco Products, Inc., California manufacturer of cleaners and metal-treatment chemicals has announced three executive promotions.

Dan T. Buist has been elected vice president-marketing. **Archie K. Beard** is the new Turco general sales manager. **Stewart B. Van Dyne** is assistant to vice president-marketing.

For the past two years, Mr. Baker has been employed by Stevens as an equipment service engineer, operating from the company's Springfield, Ohio, plant.

★ ★ ★

Kelite Corporation has promoted several men. **George S. Johnson** has been made sales manager of the Indianapolis district. **Vincent E. Bowes** moves up to midwestern regional sales manager. **Robert G. Hazel** becomes district sales manager of the Beaumont, Texas, district.

Dan T. Buist

Stewart Van Dyne

V. E. Bowes

G. S. Johnson

Archie K. Beard

Noble E. Baker

R. G. Hazel

K. C. Edson

Noble E. Baker has been appointed central Ohio sales representative for **Frederic B. Stevens, Inc.,** Metal Finishing Division, according to Frank Watt, Stevens general sales manager.

Kenneth C. Edson has been appointed Los Angeles district sales manager by **Kelite Corporation,** manufacturer of industrial chemicals and steam cleaning equipment.

John Shaughnessy has been appointed northern Ohio sales representative for **The W. W. Sly Manufacturing Co.**, Cleveland, Ohio. Sly designs and manufactures dust control systems, industrial ovens, blast cleaning equipment and tumbling mills.

Stanley R. O'Dette has been elected vice president and a director of the **Alsop Engineering Corporation**, Milldale, Conn., manufacturer of liquid processing equipment. Mr. O'Dette is also chief engineer for Alsop.

John Shaughnessy

A. I. Dranetz

Louis V. Gagnon

S. R. O'Dette

Abraham I. Dranetz has been appointed vice president of **Gulton Industries, Inc.**, and general manager of the newly created Glennite Instrument Division of the company.

★ ★ ★

H. P. Crouch, A. K. Kinder, L. O. Williams, M. Ertel and **D. Crouch** have been elected to the board of directors of **Ti-Co Industries, Inc.**, Tipton, Indiana, processors of industrial blasting and tumbling cob products.

The following officers were re-elected: H. P. Crouch, president; A. K. Kinder, vice president.

Louis V. Gagnon has joined **Enthone, Inc., a subsidiary of American Smelting and Refining Company** as a sales engineer. He will cover Boston and eastern Massachusetts.

★ ★ ★

William N. Kiely of Chicago, Ill., has been promoted to senior field sales engineer in the midwestern area for **NRC Equipment Corporation.**

Mr. Kiely has been assigned to the larger office facilities recently acquired by NRC Equipment at 3555 West Peterson Ave., Chicago, Ill.

Write for new 1958 Catalog of Paint Testing Instruments and Equipment.

GARDNER LABORATORY, INC.

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DRYING OVENS

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Clyde Lowe has been named Cleveland representative of **MacDermid Incorporated,** Waterbury, Connecticut.

Mr. Lowe is now in the Cleveland area and will work closely with MacDermid distributor salesmen in Ohio and western Pennsylvania.

True E. Read has been named special field representative for **The Pioneer Rubber Company** of Willard, Ohio.

Mr. Read had been an assistant sales manager for McKesson & Robbins, Inc., before joining Pioneer.

Clyde Lowe

L. W. Cunningham

Ralph R. Calaceto

True E. Read

Lawrence W. Cunningham has been promoted to southern region sales manager by **Kelite Corporation,** manufacturer of industrial chemicals and steam cleaning equipment.

Mr. Cunningham joined Kelite in September, 1956, as Dallas, Texas, district sales manager. Prior to his appointment, he was associated with Oakite Products, Inc., as technical service representative.

★ ★ ★

Harry Linkletter, a vice president of **Interchemical Corporation's** International Division, has been transferred to the Finishes Division to assume the duties of assistant director of sales, Metal Decorating.

William E. Bleier has been promoted to assistant Atlantic District sales manager, Metal Decorating.

Thayer R. Brown has become manager of Technical Service, Metal Decorating. Mr. Brown, who has acted in this capacity for many years on a local basis, now assumes national responsibility for Interchemical's Metal Decorating Technical Service.

Ralph R. Calaceto has been appointed manager and sales engineer of the Process Equipment Division of **Automotive Rubber Company, Inc.,** in New York City.

Mr. Calaceto's sales duties will be in connection with the development of equipment and processes for waste and recovery systems in the chemical and allied industries.

★ ★ ★

Edward J. Sears has joined the **Apothecaries Hall Division** of the **Hubbard-Hall Chemical Company** as Massachusetts sales representative. Mr. Sears formerly represented the Electrochemicals Department of E. I. Du Pont de Nemours & Co. (Inc.) in this territory.

★ ★ ★

George Townsend Underhill has been elected to the newly-created post of vice president in charge of sales for **The Seymour Manufacturing Co.,** Seymour, Conn.

From 1956 until assuming his present position, Mr. Underhill served as vice president and sales manager of Victor Manufacturing & Gasket Co.,

Chicago. Prior to that he was associated with The Chase Copper & Brass Co.

the appointment of **Louis J. Marino** as sales representative for northern New Jersey.

G. T. Underhill

Max B. Roosa

Richard F. Hurley

L. J. Marino

Max B. Roosa, formerly vice-president in charge of sales, has been elected executive vice-president of **Parker Rust Proof Company,** Detroit manufacturer of surface treatments for metals.

★ ★ ★

Frederick Gumm Chemical Co., Inc., Kearny, N. J., has announced

The **American Chemical Paint Company,** Ambler, Pa., has announced the appointment of **Richard F. Hurley** as technical sales representative for the metal-working chemicals division. He will be attached to the St. Joseph, Missouri Territory: Iowa, Minnesota, North and South Dakota, Colorado and Nebraska.

★ ★ ★

James H. Moore has been named general manager of **NRC Equipment Corporation.**

Also appointed to the management of the wholly owned subsidiary is **Harry D. Stone** of Akron, Ohio, who becomes sales manager.

★ ★ ★

Hanson-Van Winkle-Munning Co. has announced the appointment of **Herman A. Ey, Jr.,** as manager of

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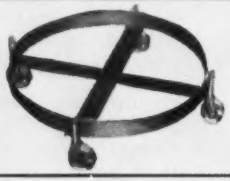

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cleaner sales. Mr. Ey's headquarters will be in Grand Rapids, Mich., at the company's midwest cleaner plant.

Herman A. Ey, Jr.

William R. Brooks

The appointment of **William R. Brooks** to the position of director of the **Binks Manufacturing Company's** Customer Research Laboratory has been announced by Burke B. Roche, president of the Chicago firm.

Mr. Brooks will have the responsibility of conducting a monthly spray painting school, held at the manufacturer's Chicago offices. This 5-day free course, is offered to any person interested in learning the latest methods of spray finishing applications as well as proper maintenance of the equipment.

In addition to directing the school, Mr. Brooks' research duties include fluid evaluation testing to determine the sprayability of new paints and materials. The results of these tests aid industrial and commercial users in the proper selection of spray finishing equipment.

★ ★ ★

Appointment of **G. Duane Franklin** as manager of paint sales and **E. Douglas Henrick** as administrative assistant have been announced by Guy Berghoff, general manager of paint sales for the merchandising division of **Pittsburgh Plate Glass Company.**

The Diversey Corporation of Chicago has purchased another plant in Hawaii, continuing its program of world-wide expansion, it has been announced by H. W. Kochs, corporation chairman. The acquisition of the **Wilson Chemical Company** of Honolulu, to be operated as a division, Diversey of Hawaii, Ltd., is the second within two weeks, the other addition being a plant in Waco, Texas.

The Chicago company, with headquarters at 1820 W. Roscoe St., manufactures and distributes chemical products and detergents for industrial use. The Honolulu plant will serve as a blending and compounding center for the production of agricultural chemicals.

HONORS

Leon Salz, manager of the Lubricants Div., **Magnus Chemical Co., Inc.,** has been awarded the **Wilbur Deutsch Memorial Award** for 1958 at the annual convention of the American Society of Lubrication Engineers,

Dr. John O. McLean (left) president of the American Society of Lubrication Engineers, presents plaque to Leon Salz, manager of the Lubricants Div., Magnus Chemical Co., Inc. Mr. Salz won the Wilbur Deutsch Memorial Award for 1958 at A.S.L.E.'s annual convention, held recently in Cleveland, Ohio.

which was held recently in Cleveland.

The award is made annually by A.S.L.E. for the most outstanding published article in the field of practical lubrication. The subject of Mr. Salz's presentation was "Choose Your Press Drawing Lubricants With Care."

SOCIETIES

Dr. Eugene G. Rochow, Professor of Inorganic Chemistry at Harvard University, has been selected to present the **Annual Joseph J. Mattiello Memorial Lecture** at the 36th Annual Meeting of the **Federation of Paint and Varnish Production Clubs** to be held in the Cleveland Public Auditorium, Cleveland, Ohio, from October 5-8, 1958.

Dr. E. G. Rochow

The title of his lecture will be "In Pursuit of an Ideal."

The Mattiello Lecture, instituted by the Federation in 1949, commemorates the name of Dr. Joseph J. Mattiello, who, as a member of the Federation, did so much to expand the application of science in the protective coatings field. Dr. Rochow is the tenth outstanding scientist to receive the paint industry's highest honor-selection as a Mattiello Lecturer.

★ ★ ★

The **National Association of Metal Finishers** has recently taken the first steps in a program of setting up standards for job-shop plating.

This action followed a recent recommendation of the Plating Trades Association of Ohio, Cleveland N.A.M.F. affiliate. This group asked that standards be set for hard chromium plating.

The N.A.M.F. executive board recently approved Standards Committee Chairman Philip Ritzenthaler's first recommendations: thickness and standards for hard chrome (Table I).

The N.A.M.F. Standards Committee also recommended that R.M.S. be shown on all blue prints and orders. Articles plated should be classified by

Table I

THICKNESS STANDARDS FOR HARD CHROMIUM PLATING

Plating Thickness (Inches)	Application
0.00005-0.0001	Carburetor parts, die-casting dies.
0.0002-0.0005	Metal-drawing dies, plastic molds, files, drills, rocker cams, punches, other molds.
0.0006-0.001	Engraving rolls, printing rolls, dies for metal blanking and drawing non-ferrous metals, electroforming mandrels, drying rolls.
0.0011-0.005	Pressure rolls, crankshafts, cylinders, parts to be used for reduction of friction wear, inspection tools, gages, dies.
Over 0.005	Parts subject to hard wear and/or corrosion: guides, journals, pumps, turbine shafts; building up worn parts, salvaging rejects, chemical equipment.

groups, according to the preparatory and post treatments specified and necessary.

NECROLOGY

Dr. W. Irving Clark, 78, retired medical director of **Norton Company** died April 5.

Dr. Clark was associated with the company for 47 years, starting as company physician in 1911. In 1919, he was made director of personnel and held this post 28 years until he was appointed medical director. After his retirement in 1948, he remained with the company as a consultant.

He was a recognized authority on industrial medicine. During his career, he wrote several books on the subject and for 12 years was an instructor in industrial medicine at Harvard University.

★ ★ ★

Arthur W. L'Hommedieu, president of **Chas. F. L'Hommedieu & Sons Co.,** Chicago, died on April 13 after a two-year illness. In 1901, Mr. L'Hommedieu joined the plating equipment and supply firm, which was founded by his father in 1898. In 1906 he was named secretary, and from 1937 until his death, served as president.

★ ★ ★

F. J. MacStoker

Franklyn J. MacStoker, a past president and honorary member of the American Electroplaters' Society, died on May 19 after a long illness. Mr. MacStoker had been a member of the New York Branch, A. E. S., and, prior to his retirement, was associated with Farrand Optical Co., New York.

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Long Island City, N. Y.
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MEETINGS of INTEREST to FINISHERS

June 14. 40th Annual Banquet, Masters Electro-Plating Association of New York, Hotel Astor, New York, New York.

June 22-27. Annual Meeting and Exhibit, American Society for Testing Materials, Hotel Statler, Boston, Mass.

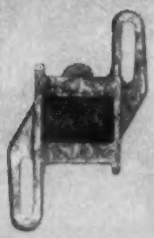
June 15-19, 1959. Golden Jubilee Convention and International Exposition, Fifth International Conference on Electrodeposition, Detroit, Mich.

July 26. Annual Stag Day, Detroit Branch, A. E. S., Hillcrest Country Club, Mt. Clemens, Mich.

Nov. 1. Philadelphia Branch, A. E. S., Annual Educational Session and Banquet, Hotel Sheraton, Philadelphia, Pa.

The Finishing Touch

"Hmm—eight-foot leap . . . temperature should be just right!"



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The one Solvent for all vapor degreasing Jobs

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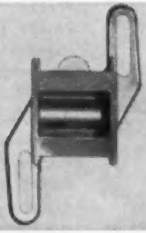

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2. As a user of BLACOSOLV trichlorethylene you can expect periodic visits from your representative. Both he and your BLACOSOLV distributor have a wealth of experience in this field, and willingly offer their assistance whenever you need it. Their technical backgrounds will help you solve any metal parts cleaning problem you might have.

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For more data circle 402 on Postpaid Card

JUNE ADVERTISERS' INDEX

Agate Lacquer Mfg. Co. 157
Alchemize Corp. 106
Allied Research Products, Inc. 20, 21
Almco, Queen Products, Inc. 137
American Brass Co. 138, 139
American Chemical Paint Co. 87
Apex Alkali Products Co. 98

Baird Machine Co. 10
Barnstead Still & Demineralizer Co. 118
Bendix Aviation Corp., Cincinnati Div. 86
Better Finishes & Coatings, Inc. 12
Blakeslee & Co., G. S. 159
Bond Chemical Products Co. 108
Brady Co., W. H. 128
Brownell's, Bob 96
By-Buk Co. 144

Capitol Machine Co. 114
Carl Mayer Corp. 152
Cellusuede Products, Inc. 64
Chainveyor Corp. ..... Fourth Cover
Chandeysson Electric Co. 65
Churchill Co., Inc., Geo. R. 92
Cincinnati Cleaning & Finishing Machinery Co. ..... Second Cover
Cohn Mfg. Co., Inc., Sigmund 116
Conforming Matrix Corp. 72
Cordo Chemical Corp. 85
Cowles Chemical Co. 30

David-Ludwig Co. 88
Day & Co., James B. 6
Dean Thermo-Panel Coil Div., Dean Products, Inc. 154
Despatch Oven Co. 11
DeVilbiss Co. 26, 27
Diamond Alkali Co. 24, 125
Dow Chemical Co. 112, 113
DuBois Co., Inc. 19
Duralac Chemical Corp. 13

Federated Metals Div., American Smelting & Refining Co. 4
Firestone Plastics Co. 56, 57
Fostoria Pressed Steel Corp. 8

Gardner Laboratory, Inc. 152
Glo-Quartz Electric Heater Co., Inc. 14

Hammond Machinery Builders, Inc. 7
Harshaw Chemical Co. 29

Industrial Filter & Pump Mfg. Co. 101
Industrial Ovens, Inc. 22
Ionic Electrostatic Corp. ..... Third Cover

Koch Sons, Inc., George 103
Kocour Co. 102
Kramer Co., H. W. 104
Kushner Electroplating School 150

Lanly Co. 97

Magnuson Products Corp. 110
Mahon Co., R. C. 16, 17
Manpro Corp. 122
Metal & Thermit Corp. 66, 67, 109
Metal Trim Co., Inc. 149
Michigan Oven Co. 123
Midland Industrial Finishes Co. 90
Morse Mfg. Co., Inc. 154

NRC Equipment Corp. 105
New Holland Machine Co. 120
Nikolas & Co., Inc., G. J. 18
Nordson Corp. 23
Norton Co. 2

Oakite Products, Inc. 1
Oronite Chemical Co. 15

Packer Machine Co. 28
Parker Rust Proof Co. 93
Pioneer Rubber Co. 107
Pittsburgh Plate Glass Co. 80, 81
Pratt & Lambert, Inc. 68, 69

Ransburg Electro-Coating Corp. 51
Ransohoff, Inc. 121
Rockwell Co., W. S. 124
Roto-Finish Co. 127

Sarco Co., Inc. 91
Sel-Rex Corp. 119
Sethco Mfg. Co. 126
Shell Chemical Corp. 117
Shuford Mills, Inc. 95
Simonds Abrasive Co. 89
Solbern Mfg. Corp. 111
Spee-Flo Corp. 99
Spraying Systems Co. 94
Spraylat Corp. 115
Stanley Chemical Co. 62, 63
Stevens, Inc., Frederic B. 3
Stewart-Warner Corp. 82, 83
Sulphur Products Co. 150

Tenax Finishing Products Co. 128
Ti-Co Industries, Inc. 150
Tousey Varnish Co. 25
True Brite Chemical Products Co. 142
Turco Products, Inc. 9

Udylite Corp. 43

Varnish Products Co. 146

Wiegand Co., Edwin L. 141
Wilder Mfg. Co., Inc. 148
Worklon, Inc. 100
Young Bros. Co. 147

For more data on advertisement on opposite page, circle 302 on Postpaid Card →

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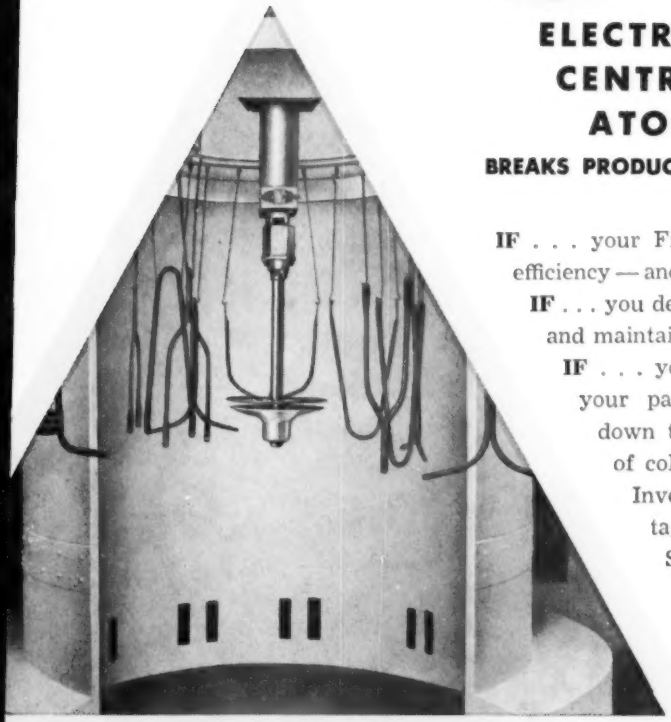

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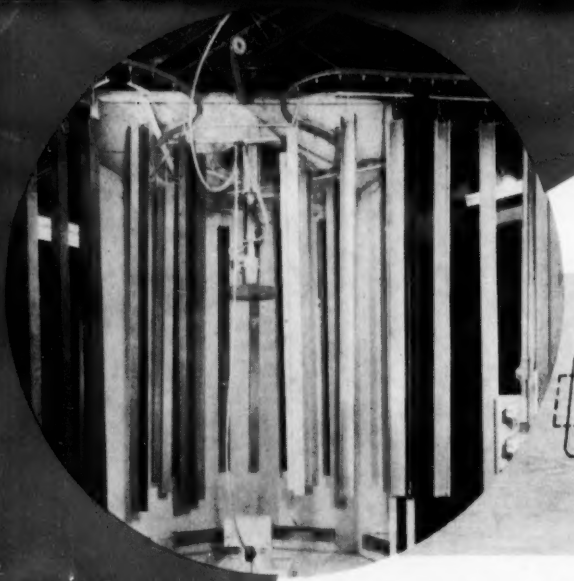
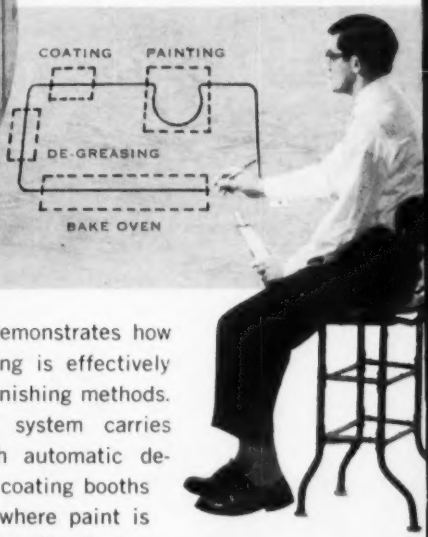


CHAINVEYOR
cuts finishing costs!



This plant installation demonstrates how modern materials handling is effectively applied to new product finishing methods. A Chainveyor overhead system carries lighting fixtures through automatic degreasing and phosphate coating booths and then into a booth where paint is applied electrostatically. Continuing along the conveyor line the fixtures are then transported to and through the bake oven completing the entire processing cycle without any manual handling. The result is better quality work — done faster and at lower cost!

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